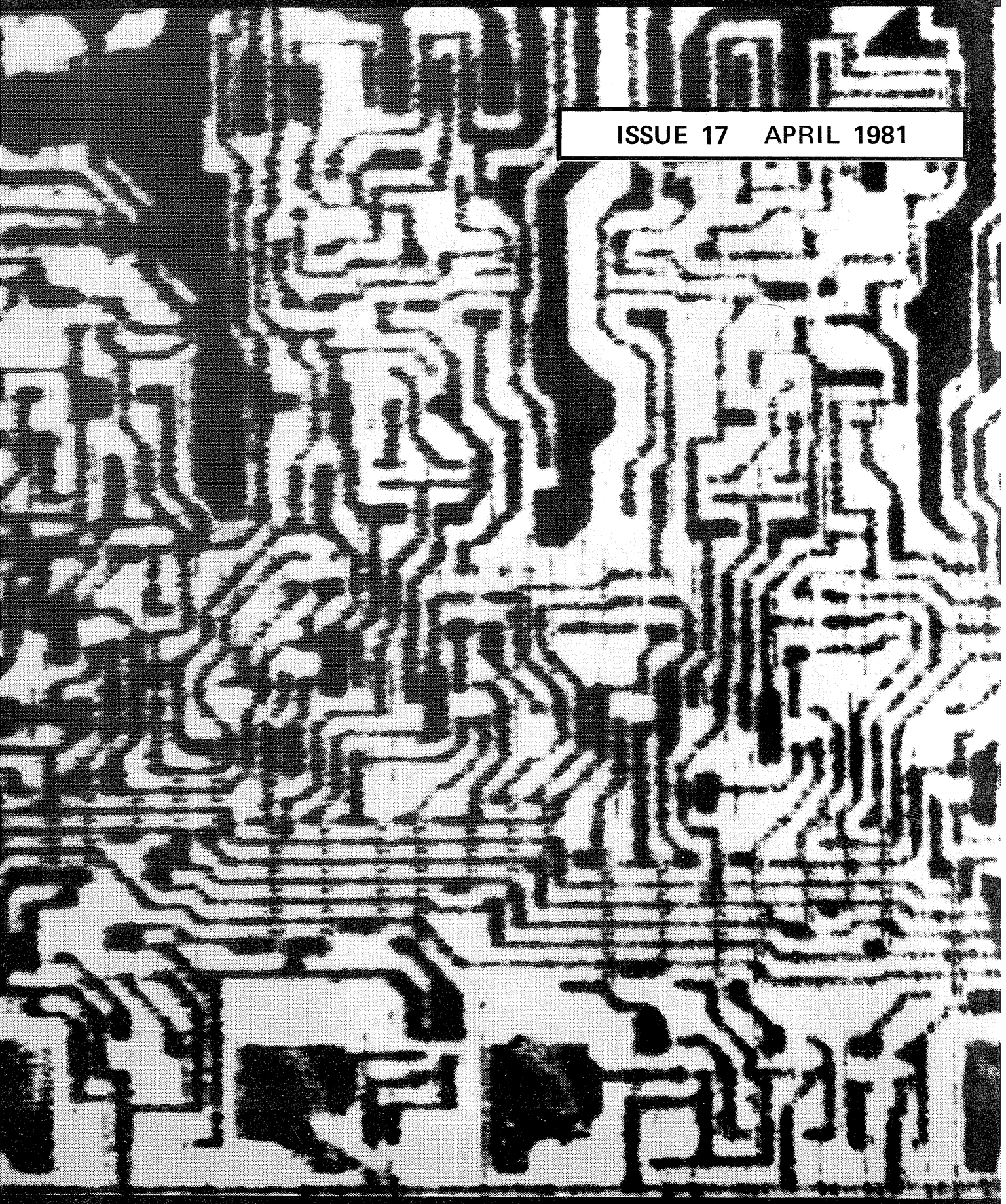
RS-80 SYSTEM 80 VIDEO GENIE



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MICRO-80

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***** ABOUT MICRO-80 *****

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MICRO-80 is an international magazine devoted entirely to the Tandy TRS-80 microcomputer and the Dick Smith System 80/Video Genie. It is available at the following prices (all prices shown in Aus.$ except for U.K. prices which are in pounds Sterling).

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The purpose of MICRO-80 is to publish software and other information to help you get the most from your TRS-80, System 80 or Video Genie and their peripherals. MICRO-80 is in no way connected with either the Tandy or Dick Smith organisations.

** WE WILL PAY YOU TO PUBLISH YOUR PROGRAMS **
Most of the information we publish is provided by our readers, to whom we pay royalties. An application form containing full details of how you can use your TRS-80 or System 80 to earn some extra income is included in every issue.

** CONTENT **
Each month we publish at least one applications program in Level I BASIC, one in Level II BASIC and one in DISK BASIC (or disk compatible Level II). We also publish Utility programs in Level II BASIC and Machine Language. At least every second issue has an article on hardware modifications or a constructional article for a useful peripheral. In addition, we run articles on programming techniques both in Assembly Language and BASIC and we print letters to the Editor and new product reviews.

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★ ★ ★ FREE SOFTWARE OFFER ★ ★ ★

EVERY NEW AUSTRALASIAN SUBSCRIBER TO MICRO-80 WILL RECEIVE A FREE CASSETTE CONTAINING THREE LEVEL I AND THREE LEVEL II PROGRAMS PLUS COMPREHENSIVE DOCUMENTATION ... THE RETAIL VALUE OF THE SOFTWARE WOULD EXCEED THE COST OF THE SUBSCRIPTION!!!

********** EDITORIAL **********

Two recent events are likely to cause some concern amongst Australian computer owners. Both are to do with increased rates of import duty. In early May, the Byelaw exemption available for importers of 5 1/4 inch floppy diskettes was removed, increasing the import duty from 2% to 35%. This was as a result of applications for protection from Verbatim Corp, which commenced assembling diskettes in Melbourne in November 1980 and Control Data Corporation, which has been producing 8 inch disks in Australia for some time and is now apparently producing 5 1/4 inch diskettes too. About the same time, the import duty on most microcomputers was raised from 2% to 6% and there is a strong possibility that this will be increased still further in the near future to 21% or even higher.

Apart from the obvious implications of these increases, which are added to the price before such items as sales tax, dealer mark up etc. the price of some imported software is also likely to be affected. Until now, sofware on diskette has been imported under the same Byelaw exemption as the diskettes themselves. Now, this software is itself subject to 35% import duty. Unless a new Byelaw is granted, it seems likely that the price of imported disk-based software in Australia will increase considerably.

The picture is rather confused at the moment, with some saying that it was never the GOvernment's intention to do anything but offer protection to the fledgeling diskette manufacturing industry whilst others are saying that it is a deliberate attempt to protect Australia's software industry. If this is so, it is doomed to failure, at least as far as '80 microcomputers are concerned. There is no way that Australians could write and Australian publishers could produce, programs as complicated as Visicalc or Scripsit or operating systems like Newdos 80 or VTOS 4.0, and sell them with all the necessary support, for prices anything like those from the USA. Even the higher duty would not make it economical because the Australian market is so small. Indeed, applying high duty to operating systems and utilities is penalising Australian authors who will need to pay more than their overseas counterparts to buy the tools of their trade.

As one of the first organisations to commence publishing '80 software in Australia, we are all for any moves which will help the Australian software industry. We are afraid, however, that these recent increases in duty will be counterproductive. The overall effect will be to make computing more expensive, thus slowing down the rate of growth in the market and making it that much more difficult for Australian programmers to sell their work.

Naturally, we are doing everything we can to obtain clarification of the situation and will keep you informed of progress.

Each month we strive to improve MICRO-80. We have had a few comments that our listings are a little difficult to read. The reason is the way in which we reproduce the magazine. In order to squeeze as much as possible into the magazine without paying the earth for paper and postage, we make up the copy and then have it photographically reduced by 20% (linearly). This means that the listings are reduced too - resulting in fairly small print and lots of white space to the right of each page. So, when MICRO-80 PRODUCTS first EPSON printer arrived, the Editorial staff purloined it immediately, put it into double-width mode and produced the listings you see in this issue. The result is listings which should be easier to read and much less wasted space. Our only reservation is that, in this mode, the printer is only 40 columns wide. Let us know if you prefer the listings done this way or would like us to return to the previous system.

G. T. BASIC has been one of the more popular series of articles we have run. Unfortunately, its author Peter Hartley, has become so involved with his own business comittments that he no longer has time to continue with it. We would like to record our thanks to Peter both from our Editorial staff and from all those readers who have enjoyed his lively and informative style of writing.

Peter had not long broken the news to us when I attended a meeting of the Adelaide '80 Users Group. This must surely be one of more friendly and lively Users Groups around and the Secretary, Rod Stevenson is a well-known correspondent on all things '80 with individuals and other Users groups around the world. Amongst the items on the agenda was a talk by Rod on string handling in general and keyboard input routines in particular. Rod's explanations were lucid and practical and, before the night was out, I had persuaded him to take up the position so recently vacated by Peter. I would like to welcome Rod as a contributor to MICRO-80 and am eagerly looking forward to his first article on programming in BASIC.

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***** REVIEW OF PROGRAMS FOR PRIMARY SCHOOLS ***** by Dave Futcher

This is a review of educational software which hopefully will appeal to educational users, particularly in primary and middle schools. It will cover a batch of educational programs from Premier Publications, 12 Kingscote Road, Addiscombe, Croydon, England. These programs are available for a number of different computers including Tandy TRS-80 and Video Genie.

NUMBER MATCHER

A real favourite of mine and the staff has been NUMBER MATCHER. Children in the primary school need plenty of practise in converting numbers to words, and in converting words into numbers. This program gives plenty of that and the children thoroughly enjoyed the experience too.

A nice feature is found in the numbers to words game, where all the words that the child needs are shown on the screen. Because of program design, it will not accept incorrectly spelt answers. This program had excellent clear screen layout and an updated score routine that was always on screen.

Although a good program that I would recommend, I would like to see some improvements. These concern different levels of play within the game, e.g.

up to hundreds
up to thousands
up to ten thousand.

MATHS EXERCISER

There are quite a few Maths Drill type programs available nowadays, but MATHS EXERCISER from Premier offers a number of additional features which make it well worth adding to a school's collection of computer programs.

The program provides practise in addition, subtraction, multiplication and division. The numbers shown on the screen have been built up from graphic blocks, thus giving nice bold figures.

The best feature was the facility that allowed you to set the level of difficulty desired for the work. This is set at the start of the session and the difficulty desired is determined by choosing the largest number that may appear in the question. In division, the difficulty is set by the largest answer. Problems up to 100 can be set.

The screen layout is clear and thus enables the child to see exactly what is expected of him. Children particularly liked the on-screen updated score routine. You always know which question number it is and how many right or wrong you have got.

SPELLING TEST

This program provides graded exercise in the spelling of a wide variety of English words. The program has a number of levels - 5 in all, giving graded practise at varying levels of ability. We found level one suitable for 8 - 9 year olds and levels two and three suitable for average ability at the top end of the middle school.

Within the structure of the program, it would be possible to set up your own data base with words appropriate to your own situation.

I liked very much the idea behind the program. You are tested 20 times in a session and each time you are given four spellings for each word and asked which one is spelt correctly. You then have to type in the spelling of the one you think to be correct. The author has chosen his words well and his "mistakes" or wrongly spelt words reflect common errors of children.

The program had some useful features worthy of note. To let you know when an input is expected, you are told by a flashing cursor, and a nice flashing sequence is used to tell you if you are right or wrong. I do like programs that summarize at the end of the session the things you have done wrong. This program does this too.

These programs came with clear instructions both on screen and good printed instructions too.

After a month's use in school across the middle school age range, they seemed bug free, crash-proof and kid-proof, even when all sorts of answers and attempts to make illegal entries were tried.

I would recommend them, the children enjoyed working with them and gained much additional practise.

The programs are reasonably priced as follows:

i) Number Matcher £5.45
ii) Maths Exerciser £5.45
iii) Spelling Test £5.45

The last two are available as a pack for $7.95. All prices include V.A.T.

My next review will look at some logic and strategy programs for use within an Educational setting.

These programs are available to your readers in Australia and New Zealand. PREMIER PUBLICATIONS already despatch their programs to all parts of the world. They are, in fact, the biggest hobby computer program supplier in the U.K. The programs will be supplied by airmail if the correct postage is included with the order.

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***** REVIEW OF TOOLKIT ***** by D. Futcher.

Recently released by PREMIER PUBLICATIONS of Croydon is a product called TOOLKIT for the TRS-80 and the Video Genie. The program contains many useful routines collected together in a package. It has great potential to the programmer.

Toolkit is supplied on cassette tape and is designed for use on cassette and disk systems. The program occupies 2K of user RAM and loads after specification of memory size. Versions are available for 16K, 32K and 48K.

RENUMBER

A renumbering routine is always one of the most used utilities that programmers have and it is good to see one here in this package. Unfortunately, renumbering has to start from the beginning of the program; but the routine does allow the specification of the start line and the size of the line steps. The routine, of course, automatically updates all the references following GOTO, GOSUB, THEN, ELSE, etc. Of course, the routine will not overcome faulty programming and invalid line numbers are replaced by !!!!! and listed on completion of routine.

DEF KEYS

This is a really useful routine which gives you a kind of shorthand. After defining your basic key words -- you can have 12 in total. They are called by a letter and a stop. For example, you could use -

D. for DATA
I. for INPUT
R. for RETURN

I found this an extremely useful routine, especially if you are entering lots of DATA lines or writing subroutines.

TRACE

I rate this to be the best facility within TOOLKIT. The routine is a great aid to debugging and is certainly a vast improvement on the TRON from Level 2. The program line numbers are shown just before execution and the whole line is displayed at the bottom of the screen. Careful selection of the TRACE speed is necessary otherwise the routine takes 'forever' or switches before you have finished figuring out what the code is doing. It is important to remember to run the program or else the TRACE function does not operate.

BLANK

This is an ideal routine for removing all the redundant spaces from program lines and thus saving valuable memory and leading to greater speed of running. Of course, the routine does not remove the spaces in PRINT and DATA statements. An additional routine is at present being written for inclusion in the package, this will be KILL. This will take out all REM lines. An excellent idea if you believe in having two copies of your programs - one a well-structured and formatted source version with lots of comments and a compressed version that is compact and fast to run.

VARIABLES

Again an excellent idea, which lists off every variable used in the program and the relevant line number. However, due to the structure of the routine and BASIC itself, the list of variables gives no indication of the variable type - A,A$,A#. It is worth noting that the list of variables are listed in alphabetical order.

FIND

This allows you find any variable, string or BASIC word, any word within the resident program. Thus the command GOSUB 5000 will display each line that contains the word. The routine worked well but it ran rather fast and you have to be pretty nimble with the shifted @ to halt the video scroll. It would be very useful to have output to the printer for the VARIABLES and the FIND routines.

APPEND

We are all aware of the fact that loading a program from cassette erases the resident program. Now with APPEND you can load a new program from cassette and retain the resident program. Of course the incoming program must have higher line numbers than the resident one. We found this very useful for amalgamating several subroutines into one program. Do remember that it works without any flashing asterisks.

SYSTEM MONITOR

This facility will be a boon to all those without an Assembler/Monitor. You can now delve into machine code. The facility has a very good clear display listing addresses in hexadecimal notation which is accessed after a hex prompt symbol asking for a 4 digit hex address. Sixteen addresses are shown on the screen at once - the preceding one, the one being addressed and the next thirteen. Within the MONITOR you can take single steps backwards and forward through memory.

SAVE

This enables you to prepare reliable copies of your machine code programs. The routine relies on the specification of start and end addresses. It is not necessary to have TOOLKIT resident to load the program later. It is also possible to modify start and entry addresses of programs with this facility.

It is PREMIER's intention to upgrade the program with further facilities within the future. Such an upgrade is REMKILLER. This has already been mentioned. Also planned are VISIONLOAD which will show a program loading to the screen as it loads from cassette, and SEARCH AND REPLACE which will search out basic words or variables and change them as desired.

PREMIER PUBLICATIONS have thus produced a product that will be of great interest to programmers. Within TOOLKIT you are provided with many facilities that are available elsewhere, but they have been assembled together within a 2K program. It is being sold at present for £29.95 which represents good value, especially when you consider the separate cost of the routines within TOOLKIT.

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***** REVIEW OF ZCHESS ***** by R. Graeme Burgin.

Generally a very good program which appears to have all of the chess abilities claimed of it, although I am not a good enough player to comment on its expertise. I find it a formidable opponent even at difficulty 1 simply because its concentration doesn't lapse nor suffer from diversions as a human might. At this level it takes the '80 about ten seconds to make its move. At difficulty 7 the '80 can take about 30 minutes to decide.

There are one or two anomalies or omissions in the printed instructions, but nothing which appears to be too serious. It is possible that the 16K version is not fully implemented as the PRINT MEN returns Ø indicating that all RAM has been filled or reserved. The instructions say to hit ENTER after the tape has loaded (about 3½ mins. under SYSTEM) but this doesn't work. It is necessary to type /17488 when the '80 displays *? after loading.

Typing "!" will restart the game at any time but don't try to return to BASIC by typing "*" as claimed. Not unless you like watching the cassette go round and round. Anyhow, if, like me, you only have 16K what's the point? ZCHESS uses the lot.

Having loaded in and initialized the program, the '80 displays a Chess board ready to go and asks you to choose "COLOR?". Type B or W as desired. The computer will then either make its opening move and/or offer you the chance to enter the square (1-64) FROM which you want to move. At this stage, the poor human appears to be able to regain some control.

About now it might become obvious that you haven't selected the level of difficulty to be played. A rather more intense perusal of the instructions gives not a clue. But wait! In the bottom right hand corner of the screen is displayed a 3. Could it be? A test run reveals that the '80 is taking about 48 seconds to make its move. This agrees with the instruction time listing for difficulty 3. Ha! But how to change it?

You remember I said that when the '80 displays FROM the human is in charge? Yes, that's it! Type Dn (n = 1-7) for level required. I can find no other way and this works so it must be it.

O.K. The show is now on the road, You are at its mercy. GOOD LUCK.

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***** '80 USERS' GROUPS *****

The following is a list of '80 Users' Groups. If you have a group that is not included here, please let us know about it so that we can publish details. Owners of System '80s are welcome at all the groups.

** AUSTRALIA **

BRISBANE: Contact: Mr. Lance Lawes,
Tel: Home (07)396 2998
Bus. (07)268 1191 Ext. 15
MEETINGS 1st Sunday of the month at 2 p.m. at 21 Rodney St. Lindum, 4178.

MELBOURNE: NORTHERN AND WESTERN SUBURBS

Contact: Mr. David Coupe (03)370 9590

MEETINGS: C.P.M. Data Systems, 284 Union Road, Moonee Ponds.
Alternate Thursdays at 7 p.m.

EASTERN SUBURBS

Contact: Mr. John Fletcher, 89 0677 bet. 9-4.

MEETINGS: 4th Wednesday of the month at 7 p.m. at Kingswood College, 355 Station St. Box Hill.

FRANKSTON: (VIC.) PENINSULAR GROUP

Contact: M.G. Thompson (03)772 2674

MEETINGS: 2nd Tuesday of the month (except Jan.)

GEELONG: GEELONG COMPUTER CLUB

Contact: The Geelong Computer Club, P.O. Box 6, Geelong, Vic. 3220.

MEETINGS: 2nd Tuesday of the month at TYBAR Engineering, Hampton St. Newtown.

DARWIN: Contact: Tony Domigan, P.O. Box 39086, Winnellie, N.T. 5789.

ADELAIDE: Contact: Rod Stevenson, 51 5241 bet. 9-4. 36 Sturt Street, Adelaide.

CANBERRA: Contact: Bill Cushing, 10 Urambi Village, Kambah ACT. 2902 (Ph. 31 6399).

MEETINGS: 3rd Thursday of each month at 7.30 p.m. in:
Urambi Village Community Centre, Crozier Circuit, Kambah.

** UNITED KINGDOM **

National Users Group in U.K.
Brian Pain, 40 High Street, Stoney Stratford, Milton, Keynes.

International TRS-80 Level I User Group,
Secretary: Mr. N. Rushton, 123 Roughwood Dr. Northwood, Kirkby, Merseyside, L33 9UG.

NEWCASTLE: Contact: John Stephen Bone 0632 770036
NPCS (Newcastle Personal Computer Society)

** NEW ZEALAND **

AUCKLAND: Contact: Ron Feasy 799 366 (Bus.) 469 455 (Priv.)

MEETINGS: 1st Tuesday of each month, 7.30 p.m. at:
NZ Solenoid Co. Ltd.,
28 Kalmia Street,
Ellerslie, Auckland.

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***** INSTALLERS FOR LOWER CASE MOD. KITS *****

MICRO-80 is seeking experienced technicians or hobbyists in each State, to instal lower case mod. kits for our readers. We will publish the names and addresses of installers each month. Individual readers should negotiate directly with the installers in their States. Although we will only publish the names of installers with adequate credentials (on paper), we can take no responsibility for the standard of service or workmanship offered. We ask individual readers to inform us of their experiences, good or bad, with the installers on our list and we will take appropriate action to amend the list, as necessary.

VICTORIA: Keith Pakenham, 20 Nicholas Street, Teesborough, 3173. (03) 798 6162.

***** REVIEW OF FULL SCREEN EDITOR ***** by John Miller.

The editing facilities provided by Level 2 BASIC are rather comprehensive though they take a little getting used to. They are very slow, however, especially if you are in the middle of developing or debugging a long program. Most frustrating is that rapid scroll, so that if you blink the whole thing has gone past, and if you freeze the screen, you can't do anything about that faulty line until the scroll is over. Computer Applications Unlimited, P.O. Box 214, Rye, New York 10580, USA have an answer. If you send them your Access or Visa card, they will send you "XEDIT" by return for $24.95 US.

XEDIT sits in the top 5K of protected RAM. The cassette contains a short loader, which runs under SYSTEM and asks if you have a small (16K), medium (32K) or large (48K) system. It then automatically reads the rest of the XEDIT tape, locates it as appropriate and initializes. Now, all you have to do is load in your BASIC program. Alternatively, you can write in a new program using all the facilities of XEDIT, but first you must type in one program using all the facilities of XEDIT, but first you must type in one line of BASIC on which it can run. In either case, you then invoke the editor by typing XEDIT [ENTER].

As you might expect from its size, XEDIT has very many functions and commands for you to learn. To help in this, a 25 page manual is supplied. This is used in conjunction with a sample BASIC program which follows on the tape. The manual takes you through each command and allows you to practice on the sample program. This is by far the best way of getting to know such a utility, and all the documentation is a model of its kind and should be emulated by other software firms.

XEDIT is very powerful, and acts on BASIC programs much as a far more costly word processor does on text. The display format is very neat, with the leftmost 5 columns reserved for line numbers, even if they are not all used. The program begins in "blinking cursor mode", with a transparent block under arrow control, with [Shift right arrow] acting as a tab or express key. The keys all repeat if held down for more than half a second. To change any character, simply type over it. [Shift D] deletes a character and the text closes up; this function is also repeating so that whole sections can rapidly be disposed of. Insertion is taken care of by [Shift I], which is also repeating. [Shift X] will extend a statement as in Level 2.

Scrolling controls are extensive. The editor normally displays 12 lines at a time. The [Enter] key performs a line-by-line scroll and is repeating. [Shift up arrow] scrolls upwards. [Shift down arrow] scrolls by pages.

Pressing [Clear] puts you in "Clear Command Mode".

Now you can

1) Delete a statement
2) Insert a statement
3) Copy a statement
4) Move or copy a statement - this involves marking the block to be moved. Whole blocks of statements can be dealt with in this way.
5) Scroll to top
6) Exit from Editor - this leaves you with a SYNTAX error which you can ignore - sour grapes from Level 2!
7) Repeat a FIND command (see below).

If you hit [space] after [clear], you are in Extended Command Mode. Now you can change the increment number for the line numbers which the editor automatically supplies as you enter a program. You can also search for a string, and if it is present the display will scroll so that the statement containing it is presented on the top line. You can search for a line number, which puts the blinking cursor on the start of that line. Even better, you can search for and change any character string in your program. With a few keystrokes, you can have the pleasure of, say, seeing all your PRINTs change to LPRINT in a twinkling.

A further Extended Command Mode function allows you to change all the macro key definitions. Yes, this program has all 26 alpha-keys defined as single key entries of BASIC key words, and you can alter these as you will. This is a real boon to rapid typing in all those MICRO-80 programs if you can't afford the cassette subscription.

The final command is Renumber, with the ability to start at any line and go in any increment. All GOSUBs etc. are changed in accordance with the new system. If lines would exceed 240 characters after renumbering or the available memory would be exceeded, then a "no room to renumber" message is briefly displayed and the function is not performed.

There are a number of provisos which are clearly set out in the documentation. XEDIT intercepts BASIC's syntax error routine, for example, and if your program contains an "ON ERROR" statement, under certain circumstances, invoking XEDIT will cause transfer to that line rather than to the editor. This is easily avoided by pressing [Clear] before going to the editor. All of the possible problems seem to have been checked out and overcome, as far as I can tell, and the manual is so comprehensive as almost to invite you to crash the program. I haven't succeeded yet.

XEDIT is compatible with new-ROM TRS-80's; one small point of detail on this is mentioned in the manual, but obviously since it uses the arrow keys so extensively, it is not compatible with unmodified Genies.

Editing a BASIC program used to be a long, backaching chore, but now, thanks to XEDIT, I can actually look forward to this. The macro key facility is a godsend; you can see exactly what is going on all the time, the search and replace functions can cut down time amazingly, and finally you can tidy the whole thing up by renumbering. XEDIT is therefore extremely powerful and convenient, in that it really comprises a package of utilities for program development and is thus well worth the modest price asked. There is also a version for EDTASM at the same price.

Finally, the owner is given all the start, end and transfer addresses for loading to other media such as floppy tape or disks - instructions for the disk transfer are given. Pokes are also given to customize the Editor so that you can speed up or slow down all the repeating key or scrolling functions. The Model 1 version does not support lower case in that it uses shifted keys for control purposes, but I have not found this to be a significant drawback. There is a version available for the Model 3 which does support lower case.

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***** MARKET PLACE *****

Market Place is available to any reader who has hardware to dispose of. An entry costs nothing - you pay MICRO-80 $5.00 or 5% commission, whichever is the greater - up to a maximum of $30, after the goods are sold. The commission is calculated on your advertised price.

KTM-2 KEYBOARD UNIT in good order	$235.00	Mr. A.R. Hall, c/o Post office Southbrook, Qld. 4352.
	**********	
AXION SERIAL THERMAL PRINTER with 8 rolls of paper and TRS-232 interface	$400.00	Mr. T. Domigan P.O. Box 390986 Winnellie, NT. 5789.
	**********	
SYSTEM-80 LEVEL II 16K MEMORY, GAMES CASSETTES, BOOKS AND MANUALS, brand new	$680.00	Mr. M. Gosbee Ph. (02)88-4468
	**********	
SYSTEM-80 L2/16K with full documentation, approx. 40 blank cassettes (data), books, magazines, and programs (mostly games) including EDTASM PLUS and Adventure No.9.	$720.00 o.n.o.	Mr. R. Glucz, 1/1707 Dandenong Rd. Oakleigh Vic. 3166 Ph.(03)543 3302AH.
	**********	
TRS-80 MODEL 1 Level II 4K excellent condition, Catalogue price $879. Sell with manuals and programs	$750.00	James Grigg Ph.(052)78 5056
	**********	
Radio Shack QUICK PRINTER: 150 LPM on 4.75" wide aluminised paper. Software selectable 80, 40 or 20 characters per line. Upper-case will full descenders. Automatic underlining. Sledom used and in excellent working order. Catalogue price $699. Will sell for:	$400.00	K. Cook, P.O. Box 931, GOVE, N.T. 5797
	**********	
SYSTEM-80 L2/16K with over $100 in programs, including BMON, RPN Calc. Sargon 3.5 Chess, Space Invaders, 70 Maths/Finance Programs. Excellent condition	$680.00	G. Hobbes, 42 Nareen Pde. NARABEEN, N.S.W. 2101 Ph.(02)913 2264
SERIAL PRINTER INTERFACE	$ 40.00	
	**********	

Continued on page 9:-

***** REVIEW OF SCRIPSIT WORD PROCESSOR BY RADIO SHACK Brian J. Fillery *****

I have not had a great deal to do with word processors except the one that appeared in the very first issue of MICRO-80. That was in BASIC and was slow, and had a few bad points in it. A friend of mine is working on a revised version of it, but I think when he tries Scripsit he will stop trying to alter the BASIC version.

Scripsit seems to answer all my needs for a word processor. It comes with a program tape, an exercise tape with both upper and lower case versions, and three audio cassettes that take you through the programming of documents as if you had never seen a computer before in your life. In addition, you are supplied with a set of stick-on labels for the special function keys, and a comprehensive instruction book.

These function keys are the 'key' to the running of the program. They control end, exchange, repeat, delete, word, line, paragraph, page, etc. You use the shift and control (@) keys for nearly all functions in combination with the function keys.

To cover all the functions that Scripsit will do would take half this magazine and then they would only be briefly covered.

The cursor can be moved anywhere within the text, up and down lines, right and left. You can with one command, move it to the start or end of the complete text, to the beginning or end of the current line.

Boundary markers tell your printer where to end the current line as it is printing it, whether to justify the line or to start a new line or paragraph or page.

Editing text is easy. You can not only change individual letters, but transpose them. You can take complete lines or words and move them elsewhere on the page. You can delete words, lines or paragraphs, or if you get desperate, you can delete a complete page.

You can format your printout exactly as you want it. Add a heading for each page, set the margins for top, bottom and the two sides just as you want them. You can print at varying line widths. Number each page if you want to, and alter the format half way through a page if the will takes you.

You can save your text on cassette (or on disk if you are using the disk version), and feed it back in for use later. In this way you can have a variety of 'standard letters' all on tape for use whenever you need them. You just have to remember that you must have Scripsit in the computer to load the texts.

I didn't have a printer so I had to do my tests on a borrowed one, not an easy way to test a program, but you do get through a lot in a short space of time. This meant that I could not test such things as printing to RS-232 interface, or printing so that the printer will wait at the end of each page whilst you put in the next page of paper. This is for those who don't use continuous rolls. If that is not enough, you can repeat any command up to 255 times. Think of all the thank you letters you could write with that little feature!

One problem is that Scripsit will not work with certain types of lower case mods. So you write your letters in upper case! They don't tell you which ones, just that it is O.K. with the Tandy mod at $99. That means that you are looking for just under $200 for the Scripsit program and the lower case mod, if you want it.

Is it value for money? Well, if you are going to use it for writing letters, I doubt if you would get your money back. You would have the most perfect letters, no errors, all nicely set out, etc., but it is probably an expensive way of doing it. As a business program you would not be too worried about the cost, it comes off tax anyway.

My comments are that it has a lot of very good features. I can see a great deal of use for it for business or the person who does a lot of writing. For the average user, no, unless you just have money to burn and like playing with words on the screen.

- 00000000 -

MARKET PLACE - Continued from page 8.

SYSTEM-80 Level 2 16K with input level indicator, right arrow and clear keys, I/P changeover switch plus Emerson cassette recorder for external input, plus 12" B&W T.V. monitor with video I/P conversion, plus 13 months of MICRO-80 issues and cassettes, plus 10 Scotch computer cassettes $700.00 the lot

Mr. B. Cameron
15 George Street
PENNANT HILLS
N.S.W. 2120

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***** REVIEW OF PMC UPPER/LOWER CASE MODIFICATION FOR SYSTEM 80/VIDEO GENIE/PMC 80 *****

by M.J. Leonard

If one is to use a small computer fully, then 'word processing' of some sort is essential.

So one saves, and before long becomes the proud owner of a dot-matrix printer. One then finds that the printer has a full set of lower case letters which it can print but which cannot be formatted on the video screen.*

One then learns that there are hardware modifications which will allow these lower case characters to appear on the screen. TRS-80 users have had access to this modification for some time, but only recently have the System 80/Video Genie/PMC 80 owners had this facility offered to them.

It is now available in kit form from Personal Micro Computers, Inc., 475 Ellis Street, Mt. View, California 94043 for US$75 plus US$5 for packing and airmail postage.

The kit contains three ICs. One is attached to a small PC board; this takes the place of the existing character generator IC. The other two mount piggy-back over existing ICs. Also included is a cassette with the Driver program for both cassette and disk (TRSDOS and NEWDOS) and a Fix program, in both cassette and disk versions, for producing a fixed or combined version of 'Electric Pencil' that includes the lower case driver.

Installation requires a small low voltage soldering iron, about 15cm of fine insulated hook-up wire and only a moderate amount of skill.

The instructions are quite clear, once one has realised that the "interface board" referred to is the board nearest the cassette player and that the ICs on it are numbered from Z1 starting in the front right-hand corner, (a small diagram would have made things clearer).

Results are excellent. Letters are Gothic in style and are clear and distinct. Lower case letters are printed without descending below the line, so that g, j, p. q and y look unusual, although this is normal in this type of modification. Characters are as on keyboard, with one exception, shifted @ which is shown as a backward slash prints a reversed apostrophe - used for opening a quotation within a program. The driver provides a Caps Lock facility - Shift/Esc locks; Shift/Ctrl unlocks - and Keyboard Debounce. It is loaded with a System command and does not load in user reserved memory. If any memory has been reserved, the driver loads itself directly below that memory and is self-protecting.

Personal Micro Computers Inc. were very prompt in handling the order, mailing took two weeks and did not attract Australian Customs Duty.

The modification is recommended with the only qualification being that if you are all thumbs with a soldering iron, seek assistance and, having completed the installation, inspect all soldering with a magnifying glass to make certain no solder dags are likely to cause trouble.

An interesting sidelight with the new character generator is that commercial games, such as "Galaxy Invasion", take on a new appearance as their messages are written in both upper and lower case.

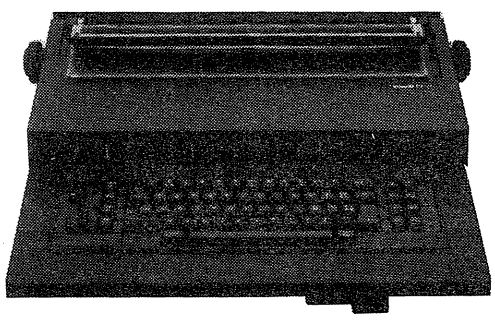
* Programs are available, such as 'Text Typer" which indicate on the screen when shifted characters are used. But while these programs are excellent for occasional use, full upper/lower case function is necessary for serious word processing.

- 00000000 -

Daisy Wheel Typewriter/Printer

MICRO-80 has converted the new OLIVETTI ET-121 DAISY WHEEL typewriter to work with the TRS-80 and SYSTEM 80 or any other microcomputer with a Centronics parallel port (RS 232 serial interface available shortly). The ET-121 typewriter is renowned for its high quality, fast speed (17 c.p.s.), quietness and reliability. MICRO-80 is renowned for its knowledge of the TRS-80/SYSTEM 80 and its sensible pricing policy. Together, we have produced a dual-purpose machine:- an attractive, modern, correcting typewriter which doubles as a correspondence quality Daisy-wheel printer when used with your micro-computer.

How good is it? - This part of our advertisement was typeset using an ET-121 driven by a TRS-80. Write and ask for full details.



ONLY $1995 INC. S.T.

***** READERS' REQUESTS *****

This column is a regular feature of MICRO-80. In it, we list all those articles, programs, etc. requested by our readers. We invite contributions from readers to satisfy these requests and will, of course, pay a publication fee for all articles, programs etc. printed. As a guide, we will pay a minimum publication fee of $10 for any article or review published. In the case of software reviews, we will aim to pay in accordance with the value of the program, up to a maximum of $25. So, if you write a good review which we publish and the usual selling price of the program in Australia is $19.95, then we would pay you $20. In that way, the successful reviewer will get the program he reviews, free. (Make sure you include the selling price in your review). Unfortunately, we cannot afford that policy on hardware (!) so we will pay in accordance with the merits of the review - generally of the order of $25. Submission of a review for publication automatically means that you are prepared to accept the figure we decide to pay you and no correspondence will be entered into. Payment will be made within 30 days of publication.

* ARTICLES **

- File handling on the '80
- Description of the functions performed by the Expansion Interface
- Reviews of '80 compatible printers
- Reviews of commercially available software (including that produced by us!)
- Reviews of commercially available hardware
* A master index to the appropriate sections in the Tandy Manuals in Level I, Level II,DOS etc.
- Comparative reviews of disk drives
- How to convert a Level I program to Level II
- A simple guide to using level I Arrays
* An explanation of how to make full use of USR, PEEK and POKE statements
- Discussion of the various electric fields produced by the keyboard, tape recorder, monitor disk drives etc., how to measure them, how important they are and how to combat them

** SOFTWARE **

* A m.l. program to enable the break key to work like RESET when using an expansion interface
- Stock market program
* Horse racing system
- "Files" program modified for 48K system
* Morse code decoder
- Sub-routine Forum
- A new STAR-TREK game
- Conversational programs (like Eliza)
- 3D programs (such as a maze seen from the inside)
- Program to scroll a Level II listing, one line at a time
- Modification to SCRIPSIT which will enable it to output to the SYSTEM 80 printer port
- Double Precision Trig, Log and Exponential machine language routines

** HARDWARE **

- Interfacing the '80 to external hardware
- Review on the performance of line filters
- Real Time clock
* Radio Teletype/Morse interfacing
- RFI (Radio Frequency Interference) suppression
- Interface for a Teletype printer

Note:- An * denotes that we already have some suitable material on hand for this topic.

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********** SOFTWARE SECTION **********

***** ADVENTURE IN MURGLE LI/4K BY - G. MOAD *****

This program proves that an adventure game can be written in Level I BASIC. Residing in only 4K, the game is quite a simple one but it is still possible to get lost in the forest, making it an enjoyable game. If you have more than 4K memory in your machine, it is very easy to expand the program, making it even more difficult to play.

The game commences with you standing on a hill somewhere in a forest. In the distance, you can see a building standing in a clearing, next to a stream. In the best traditions of adventure games, that is all the help we are going to give you. From now on, you are on your own. If you really get stuck, try typing in HELP.

The introduction to the program starts at Line 50 and ends at Line 65. Lines 1000 to 3000 are messages to be displayed on the screen. The large gaps between each line number allow for program expansion. The main program logic is between Lines 5000 and 5030. This section asks what you want to do next, checks the answer for legality and carries out all legal directives. There are more screen messages in Lines 6510 - 6630. The Read, Grab and Dig directives are analysed at 6700 and acted on between this line and 6920. From 7000 to the end of the program, can be found a clear screen routine as well as various Lines for putting trees, the top of a hill, a river and the building onto the screen.

```
**************************************
*     AN ADVENTURE IN LEVEL I        *
*          BY GRAEME MOAD            *
**************************************
```

```
10 CLS
11 P.AT206,"]] AN ADVENTURE IN LEVEL 1 ^
^
12 P.AT270,"]]      BY GRAEME MOAD      ^
^
20 A(41)=2:A(42)=8:A(43)=5:P=2
30 F.I=1TO40:REA.A(I):N.I
40 D.5,5,1,6,5,5,4,8,10,10
42 D.3,3,3,7,1,4,8,8,8,4
44 D.2,2,2,1,2,5,3,7,4,6
46 D.4,1,7,9,6,10,8,8,8,10
50 P.AT512,"ONCE UPON A TIME IN THE LAND
  OF MURGLE..."
51 P."WHATS THAT!  YOU NEVER HEARD OF MU
RGLE.
52 P."WELL, BY CHANCE, WE HAVE ACCESS TO
  A TIME RELOCATING SYSTEM
53 P."(MODEL 80) AND YOU CAN SEE FOR YOU
RSELF WHAT HAPPENED.
56 P."ALL YOU HAVE TO DO IS ENTER THE SE
CRET CODE NUMBER 1
58 I.A:CLS:IFA<>1G.56
60 GOS.65:P."WAIT!  I DIDN'T GIVE YOU DI
RECTIONS":GOS.65
63 P."DON'T LET THE HOOGLY LOOSE!":GOS.6
5:CLS:G.7000
65 F.A=0TO20:P.T.(R.(60));"*":F.B=0TO20:
N.B:N.A:RET.
1000 P."I AM";:RET.
2000 P."  IN A FOREST";:RET.
2010 P."  ON TOP OF A HILL";:RET.
2020 P."  BESIDE A BUILDING";:RET.
2030 P."  IN A CLEARING";:RET.
3000 P."  WITH TREES ALL AROUND.":RET.
3010 P."."":RET.
3020 P."  BESIDE A STREAM.":RET.
5000 H=0:N=1:S=2:E=3:W=4:L=5:O=6:G=7:R=8
:D=9
5010 P.AT832,"WHAT NOW";:I.X
5015 IF(X>0)*(X<10)G.5020
5016 IFX<>0P."ILLEGAL DIRECTIVE":G.5000
5018 P."COMMANDS:  HELP NORTH SOUTH EAST
WEST LOOK OPEN GRAB READ DIG
5020 ONX6.6100,6200,6300,6400,6500,6600,
6700,6800,6900
5030 G.5000
6100 P."GO NORTH":P=A(P):G.7000
6200 P."GO SOUTH":P=A(P+10):G.7000
6300 P."GO EAST":P=A(P+20):G.7000
6400 P."GO WEST":P=A(P+30):G.7000
6500 P."LOOK AROUND":P.AT64,"";
6505 ONPGOS.6510,6510,6510,6510,6510,651
5,6520,6510,6525,6510
6506 IFP=A(43)P.AT87," AND A SHOVEL.
6507 IF(P=A(42))*(A(41)=1)P.AT87," AND A
  KEY.
6509 G.5000
6510 P."I CAN SEE LOTS OF TREES.":RET.
6515 P."THE FOREST APPEARS TO EXTEND END
LESSLY IN ALL DIRECTIONS.
```

```
6516 P."THERE'S A SMALL CLEARING TO THE
SOUTH WEST.":RET.
6520 P."IT DOESN'T LOOK TOO DEEP.":RET.
6525 P."IT'S A SMALL STONE BUILDING WITH
 NO WINDOWS AND A STURDY
6526 P."WOODEN DOOR.  THERE IS A SIGN AB
OVE THE DOOR.":RET.
6600 IFP<>9P."I DON'T KNOW HOW TO OPEN A
 TREE":G.5000
6610 IFA(42)>OP."THE DOOR'S LOCKED":G.50
00
6620 P."OH NO!!! IT'S THE HOOGLY !!!!!
6630 GOS.65:P."NOW WASN'T THAT FUN":END
6700 IF((P=A(42))*(A(41)=1))+(P=A(43))T.
6720
6710 P."THE TREE'S JUST TOO HEAVY":G.500
0
6720 P."OK, I'VE GOT THE ";:IFP=A(42)P."
KEY":A(42)=O
6725 IFP=A(43)P."SHOVEL":A(43)=O
6730 P.AT87,".":G.5000
6740 P."THE TREE'S JUST TOO HEAVY":G.500
0
6800 IFP=9P."THE SIGN SAYS:  'DANGER - DO
 NOT OPEN DOOR'":G.5000
6810 P."THE LEAVES ARE GREEN":G.5000
6900 IFA(43)>OP."I'M NOT DIGGING WITH MY
 BARE HANDS":G.5000
6910 IF(P=A(42))*(A(41)=2)THENA(41)=1:P.
"I'VE FOUND SOMETHING":G.5000
6920 P."I DIDN'T FIND ANYTHING":G.5000
7000 GOS.8000:ONPGOS.8100,8100,8100,8100
,8100,8200,8300,8100,8400,8100
7010 G.5000
8000 F.A=OTO6:P.ATA*64,"  ":N.A:P.ATO,"";
:RET.
8100 GOS.1000:GOS.2000:GOS.3000
8110 GOS.8150:F.I=OTO5:A=RND(52):GOS.816
0:N.I:RET.
8150 F.A=7TO14:P.ATA*64,"  ":N.A:RET.
8160 P.AT520+A,"[";:P.AT583+A,"[[[";:P.A
T646+A,"[[[[[";
8170 P.AT709+A,"[[[[[[[";:P.AT775+A,"(#)
";:RET.
8200 GOS.1000:GOS.2010:GOS.3010
8250 GOS.8150:P.AT512,"-  -  -  -  -  -  -":P.
AT591,"-  -  -  -  -"
8260 A=8:GOS.8160:A=16:GOS.8160:A=20:GOS
.8160:A=50:GOS.8160:RET.
8300 GOS.1000:GOS.2000:GOS.3020
8310 GOS.8150:F.I=OTO75:SET(I,32):N.I:F.
I=30TO95:SET(I,33):N.I
8320 F.I=50TO127:SET(I,34):N.I:A=15:GOS.
8160:A=45:GOS.8160
8330 A=10:GOS.8160:A=49:GOS.8160:RET.
8400 GOS.1000:GOS.2020:GOS.2030:GOS.2000
:GOS.3010
8410 GOS.8150:P.AT540,"-  -  -  -":P.AT602,
"/       /":P.AT664,"/       /"
8420 P.AT729,"!   ##   !":P.AT793,"!   ##
!"
8440 A=0:GOS.8160:A=30:GOS.8160:A=34:GOS
.8160:A=50:GOS.8160:RET.
```

***** FRUSTRATION LI/4K BY L. BINET *****

This is another Level II program which has found its way to a Level I machine. The Level II version of the program was published in Issue 2 of MICRO-80, the rules for this game are the same. A pair of O's flash on the screen for a random length of time, then a clock starts counting in their place. You have to press CLEAR as soon as the clock starts. When you press CLEAR, your score is placed on the screen. You will see the slowest score, the fastest and the last score. If you press the CLEAR key too early, you will be accused of cheating and be penalised.

Subroutine 2000 decides whether one or two 0's are to be displayed. Line 35 tests point (0,0). If this point is off, then the program jumps to Line 4000 which tells you that you have been caught cheating. Line 50 clears the centre of the screen and sets the clock count to zero. Line 60 increments the clock count by one, prints the current count at the centre of the screen and tests point (0,0) to see if you have pressed CLEAR. If you haven't, the program repeats this line.

```
1  REM  ************************************
2  REM  *     FRUSTRATION FOR LEVEL I      *
3  REM  *              BY L. BINET         *
4  REM  ************************************
5  Y=1:N=0:C=0:H=0:L=0
10 CLS:P."WELCOME TO FRUSTRATION
20 I."DO YOU WANT THE RULES";Q:IFQ=1GOS.
1000
30 CLS:P.AT540;:S.(0,0):F.I=1TOR.(250):G
OS.2000
35 IFP.(0,0)=0G.4000
40 P.AT540;A$:N.I
50 P.AT540,"   ":K=0
60 K=K+1:P.AT540,K:IFP.(0,0)G.60
70 IF(H=0)+(K<H)H=K
80 IFK>LL=K
90 CLS:P."THIS TIME YOU SCORED . .";K
100 P."YOUR HIGHEST SCORE IS . ";H
110 P."YOUR LOWEST SCORE IS . .";L
115 P."YOUR RATING IS ";(100-(I.(C)*5))*
(100-H)/100
120 P."YOU HAVE CHEATED ";C;"TIMES
130 I."DO YOU WANT ANOTHER GAME";Q:IFQ=0
G.150
140 G.30
150 CLS:P."O.K. SEE YOU ROUND
160 E.
1000 CLS:P."F R U S T R A T I O N
1010 P."A GAME OF SKILL FOR PEOPLE WITH
1020 P."NOTHING TO DO.
1030 P."WATCH THE ELECTRONIC CLOCK IN TH
E CENTRE OF
1040 P."THE SCREEN. WHEN THE CLOCK START
S
1050 P."COUNTING STOP IT AS QUICKLY AS P
OSSIBLE
1060 P."BY PRESSING CLEAR. SOMETIMES IT
TAKES A LONG TIME
1070 P."TO START THOUGH
1080 P."G O O D   L U C K . . .
1090  I."PRESS ENTER WHEN YOU ARE READY
TO START";A$:RET.
2000 R=R.(4):ONRG.2010,2020,2030,2040
2010 A$="  0":RET.
2020 A$="0  ":RET.
2030 A$="00":RET.
2040 A$="   ":RET.
4000 C=C+1:P."YOU HAVE BEEN CAUGHT CHEAT
ING":G.120
```

***** SETTING NON-GRAPHICS LII/4K Adapted from a program by D. Ward *****

For some time now, there has been a Readers' Request for a program which will allow the SET statement to be used with any characters, rather than just graphics. Well, at long last, here it is. The heart of the program is in the sub-routine at Line 60000 which has been designed so that you may use it in your own programs. The rest of the listing is a demonstration program to illustrate its use.

Type in the demonstration program and RUN it. In response to the prompt, supply the desired value along the X axis at which the character is to be "SET". The value supplied should obey the normal rules for the SET statement, ie. X should have a value between 0 and 127. Similarly, respond to the Y axis prompt with a value between 0 and 47.

When you have done this, the program first SETs a normal graphic block at X and Y and then, after a short delay, SETs a predetermind non-graphic of "*" at the same position. For example, if you had answered the X axis prompt with 60 and the Y axis prompt with 30, the program would first SET(60,30), which would appear as a graphics block then, after a short pause, would SET "*" at the same location, (blocking out the graphic SET). The program then loops a few times, alternatively SETting graphic blocks and non-graphics, before returning to ask for new values for X and Y.

The bulk of the program is for demonstration purposes. The subroutine at line 60000 will SET non-graphics when included in your own programs, provided that your program provides the following information BEFORE calling the subroutine:

Somewhere in YOUR program you should enter the character that is to be SET into the string variable A$
eg.

```
10 A$="*"
```

Your program must also supply the values for X and Y in the NORMAL set range, (ie. 0 to 127 for X and 0 to 47 for Y).

So, prior to calling the subroutine YOUR program would look something like this:-

```
10 A$="*"
20 X=60:Y=30
```

One other important thing to mention is that the subroutine alters the values of X and Y. Therefore, if YOUR program is going to perform other calculations on the ORIGINAL values of X and Y you should preserve the values as in this example.

```
10 A$="*"
20 X=60:Y=30:REM NORMAL SET VALUES
30 XX=X:YY=Y:REM COPY ORIGINAL VALUES OF X & Y INTO XX & YY
40 GOSUB60000:REM CALL ROUTINE TO SET * AT X AND Y
50 X=XX:Y=YY:REM COPY ORIGINAL VALUES BACK INTO X AND Y
60 END
```

```
**********************************************
*     SETting NON GRAPHIC CHARACTERS         *
*              ADAPTED BY MICRO-80           *
*     FROM A PROGRAM BY DARRIN WARD          *
**********************************************
```

```
100 CLS:INPUT"ENTER CHARACTER TO BE SET
";A$:INPUT"X AXIS (0TO127) ";X:INPUT"Y A
XIS (0TO47) ";Y
110 XX=X:YY=Y
120 X=INT(X/2):Y=INT(Y/3):'
    CONVERSION STEP 1
130 CLS:FORE=1TO10:'      LOOP A FEW TIMES
 SO THEY GET THE IDEA
140 PRINT@0,"GRAPHIC SET MODE   ":SET(XX,
YY):' NORMAL SET HERE
150 FORT=1TO500:NEXTT:PRINT@0,"CHARACTER
 SET MODE":'      PAUSE
160 PRINT@64*Y+X,A$;:'     CONVERSION STEP
 2 PLUS CHARACTER SET
170 FORT=1TO500:NEXTT:'
          PAUSE AGAIN
180 NEXTE
190 GOTO100:'
60000 X=INT(X/2):Y=INT(Y/3):PRINT@64*Y+X
,A$:RETURN:'
THIS IS A STAND ALONE SUBROUTINE. YOUR P
ROGRAM
SHOULD PROVIDE THE VALUES FOR X AND Y ON
 ENTRY.
```

***** VARIABLES WORKSHEET LII/16K & Printer (C) S.& P. Miller *****

Learning BASIC on the TRS-80 is great but choas can result if a little discipline is not imposed. I have found it necessary to note, (on bits of paper all over the place), the variables I have used, just to know which ones are still available. Having a printer I decided to produce a sheet on which I could note the variables used and other forgettable points during program development and later examination. This program produces an appropriate sheet, to order.

The program when RUN gives the user the flexibility of selecting how many lines are required, (and how many copies). It then produces the form below, (PROVIDED YOU HAVE A PRINTER OF COURSE), upon which you can record the name of the program you are working on, details of the variables used, what they where used for, etc etc.

The sample worksheet below, was produced for a program having the following parameters (the numbers after the question marks are the answers supplied by the operator to the promptsdisplayed on the screen):-

```
      VARIABLE WORKSHEET
                                BY S & P MILLER - FOR THE TRS-80
ENTER MAX. NUMBER OF ARRAYS  ? 2
ENTER MAX. NUMBER OF SUBROUTINE LINES REQUIRED  ? 5
ENTER MAX. NUMBER OF VARIABLE LINES REQUIRED  ? 10
ENTER NUMBER OF COPIES REQUIRED  ? 1
READY
>_
```

```
VARIABLE WORKSHEET
PROGRAM :                          PROGRAMMER :                    DATE :  /  /19
:
MEMORY CLEARED -              MEMORY PROTECTION AT -
LIST OF TYPE DEFINITIONS :-
 DEFSTR ---
 DEFINT ---
 DEFSNG ---
 DEFDBL ---
LIST OF DIMENSIONED ARRAYS :-
 DIM    (    )    : NAME :
 DIM    (    )    : NAME :
SUBROUTINE INFORMATION :-
 START £:   END £ : COMMENTS
 ------ : ------ : ----------------------------------------
 ------ : ------ : ----------------------------------------
 ------ : ------ : ----------------------------------------
 ------ : ------ : ----------------------------------------
 ------ : ------ : ----------------------------------------
VARIABLE LIST :-
 NAME                LABEL/USE
  ---              ----------------------------------------
  ---              ----------------------------------------
  ---              ----------------------------------------
  ---              ----------------------------------------
  ---              ----------------------------------------
  ---              ----------------------------------------
  ---              ----------------------------------------
  ---              ----------------------------------------
  ---              ----------------------------------------
  ---              ----------------------------------------
PERIPHERALS REQUIRED :-
 CASSETTE £ 1 ( ):CASSETTE £ 2 ( ):PRINTER ( ) :DISCS ( ) NUMBER REQUIRED --
NOTES:-
```


*****SAVE 00$'s ***SAVE 00$'s ***SAVE 00$'s ***MICRO-80 EXPANSION INTERFACE *****

MICRO-80's expansion interface utilises the proven LNW Research Expansion board. It is supplied fully built up and tested in an attractive cabinet with a self contained power supply, ready to plug in and go. The expansion interface carries MICRO-80's full, no hassle, 90-day warranty.

Features include:- o Sockets for up to 32K of memory expansion o Disk controller for up to 4 disk drives o Parallel printer port o Serial RS232C/20mA I/O port o Second cassette (optional)

The expansion interface connects directly to your TRS-80 L2/16K keyboard or, via SYSPAND-80 to your SYSTEM-80VIDEO GENIE

Prices: HD-010-A Expansion Interfaces with Ø K : $415.00 HD-010-B Expansion Interfaces with 32K : $475.00 HD-011 Data separator fitted (recommended) : add $25.00 HD-012 Dual cassette Interfaces fitted : add $15.00.

The MICRO-80 Expansion Interface is also available in kit form.

Prices: HD-013 Kit consisting of LNW Research PC board and manual, ALL components including cabinet & power supply : $335.00 HD-011 Data separator for above : $22.00 HD-013 Dual cassette Interface kit : $12.00.

DON'T BE HELD BACK BY AN ANTIQUATED DISK OPERATING SYSTEM

MOVE UP TO

NEWDOS 80 **$149 incl. p&p**

NEWDOS 80 is a completely new DOS for the TRS-80 SYSTEM 80. It is well-documented, bug free and increases the power of your system many times over. It is upward compatible with TRSDOS AND NEWDOS (ie TRSDOS and NEWDOS+ programs will run on NEWDOS 80 but the reverse is not necessarily so).

These are just a few of the many new features offered by NEWDOS 80.

* New BASIC commands that support variable record lengths up to 4095 bytes long.
* Mix or match disk drives. Supports any track count from 18 to 96. Use 35, 40, 77 or 80 track 5¼ inch mini disk drives, 8 inch disk drives OR ANY COMBINATION.
* An optional security boot-up for BASIC or machine code application programs. User never sees "DOS-READY" or "READY" and is unable to "BREAK", clear screen or issue any direct BASIC statements, including "LIST".
* New editing commands that allow program lines to be deleted from one location and moved to another or to allow the duplication of a program line with the deletion of the original.
* Enhanced and improved RENUMBER that allows relocation of subroutines.
* Create powerful chain command files which will control the operation of your system.
* Device handling for routing to display and printer simultaneously.
* MINIDOS – striking the D, F and G keys simultaneously calls up a MINIDOS which allows you to perform many of the DOS commands without disturbing the resident program.
* Includes Superzap 3.0 which enables you to display/print/modify any byte in memory or on disk.
* Also includes the following utilities:
  - Disk Editor/Assembler
  - Disassembler (Z80 machine code)
  - LM offset – allows transfers of any system tape to Disk file – automatically relocated.
  - LEVEL I – Lets you convert your computer back to Level 1.
  - LVIDKSL – Saves and loads Level 1 programs to disk.
  - DIRCHECK – Tests disk directories for errors and lists them.
  - ASPOOL – An automatic spooler which routes a disk file to the printer whilst the computer continues to operate on other programs.
  - LCDVR – a lower case drives which display lower case on the screen if you have fitted a simple lower case modification.

DISK DRIVE USERS ELIMINATE CRC ERRORS AND TRACK LOCKED OUT MESSAGES FIT A PERCOM DATA SEPARATOR

$37.00 plus $1.20 p&p.

When Tandy designed the TRS-80 expansion interface, they did not include a data separator in the disk-controller circuitry, despite the I.C. manufacturer's recommendations to do so. The result is that many disk drive owners suffer a lot of Disk I/O errors. The answer is a data separator. This unit fits inside your expansion interface. It is supplied with full instructions and is a must for the serious disk user.

MPI DISK DRIVES HIGHER PERFORMANCE – LOWER PRICE

MPI is the second largest manufacturer of disk drives in the world. MPI drives use the same form of head control as 8" drives and consequently, they have the fastest track-to-track access time available – 5msec! All MPI drives are capable of single or double-density operation. Double-density operation requires the installation of a PERCOM doubler board in the expansion interface.

As well as single head drives, MPI also makes dual-head drives. A dual-head drive is almost as versatile as two single-head drives but is much cheaper.

Our MPI drives are supplied bare or in a metal cabinet – set up to operate with your TRS-80 or SYSTEM 80. All drives are sold with a 90 day warranty and service is available through MICRO-80 PRODUCTS.

MPI B51 40 Track Single Head Drive. . . . . .only $339
MPI B52 40 Track Double Head Drive. . . . .only $449

Prices are for bare drives and include p&p. Add $10.00 per drive for a cabinet and $60.00 for a power supply to suit two drives. 40 track drives are entirely compatible with 35 track drives. A 40 track DOS such as NEWDOS 80 is necessary to utilise the extra 5 tracks.

OVER 800 KILOBYTES ON ONE DISKETTE! WITH MPI 80 TRACK DRIVES

MPI 80 track drives are now available. The B91 80 track single-head drive stores 204 Kilobytes of formatted data on one side of a 5¼ inch diskette in single-density mode. In double-density mode it stores 408 Kilobytes and loads/saves data twice as quickly.

The B92 80 track dual-head drive stores 204 Kilobytes of formatted data on EACH side of a 5¼ inch diskette in single-density mode. That's 408 Kilobytes per diskette. In double-density mode, the B92 stores a mammoth 408 Kilobytes per side or 816 Kilobytes of formatted data per diskette. With two B92's and a PERCOM double, you could have over 1.6 Megabytes of on line storage for your TRS-80 for less than $1500!!

MPI B91 80 Track Single Head Drive. . . . . .only $499
MPI B92 80 Track Dual Head Drive . . . . . .only $599

Prices are for bare drives and include p&p. Add $10.00 per drive for a cabinet and $60.00 for a power supply to suit two drives. Note: 80 track drives will not read diskettes written on a 35 or 40 track drive. If drives with different track counts are to be operated on the same system, NEWDOS 80 must be used.

CARE FOR YOUR DISK DRIVES? THEN USE 3M's DISK DRIVE HEAD CLEANING DISKETTES

$30.20 incl. p&p.

Disk drives are expensive and so are diskettes. As with any magnetic recording device, a disk drive works better and lasts longer if the head is cleaned regularly. In the past, the problem has been, how do you clean the head without pulling the mechanism apart and running the risk of damaging delicate parts. 3M's have come to our rescue with SCOTCH BRAND, non-abrasive, head cleaning diskettes which thoroughly clean the head in seconds. The cleaning action is less abrasive than an ordinary diskette and no residue is left behind. Each kit contains:

- 2 head cleaning diskettes
- 1 bottle of cleaning fluid
- 1 bottle dispenser cap

PLEASE USE ORDER FORM ON PAGE 36

USE TANDY PERIPHERALS ON YOUR SYSTEM-80 VIA SYSPAND-80 – $119 incl. p&p

The SYSTEM-80 hardware is not compatible with the TRS-80 in two important areas. The printer port is addressed differently and the expansion bus is entirely different. This means that SYSTEM-80 owners are denied the wealth of economical, high performance peripherals which have been developed for the TRS-80. Until now, that is. MICRO-80 has developed the SYSPAND-80 adaptor to overcome this problem. A completely self-contained unit in a small cabinet which matches the colour scheme of your computer, it connects to the 50-way expansion part on the rear of your SYSTEM 80 and generates the FULL Tandy 40 way bus as well as providing a Centronics parallel printer port. SYSPAND-80 enables you to run an Exatron Stringy Floppy from your SYSTEM 80, or an LNW Research expansion interface or any other desirable peripherals designed to interface to the TRS-80 expansion port. Make your SYSTEM 80 hardware compatible with the TRS-80 via SYSPAND-80.

PROGRAMS BY MICROSOFT

EDITOR ASSEMBLER PLUS (L2/16K) $37.50 + $1.20 p&p

A much improved editor-assembler and debug/monitor for L2/16K TRS-80 or SYSTEM 80. Assembles directly into memory, supports macros and conditional assembly, includes new commands-substitute, move, copy and extend.

LEVEL III BASIC $59.95 plus $1.20 p&p

Loads on top of Level II BASIC and gives advanced graphics, automatic renumbering, single stroke instructions (shift-key entries) keyboard debounce, suitable for L2/16K and up (Not Disk BASIC)

ADVENTURE ON DISK $35.95 plus $1.20 p&p

This is the original ADVENTURE game adapted for the TRS-80. The game fills an entire diskette. Endless variety and challenge as you seek to rise to the level of Grand Master. Until you gain skill, there are whole areas of the cave that you cannot enter. (Requires 32K One Disk)

BASIC COMPILER $208 plus $2.00 p&p

New improved version, the Basic Compiler converts Disk BASIC programs to machine code, automatically. A compiled program runs, on average, 3-10 times faster than the original BASIC program and is much more difficult to pirate.

UPGRADE TO 16K FOR ONLY $30.00!!

MICRO-80's 16K MEMORY EXPANSION KIT HAS BEEN REDUCED IN PRICE EVEN MORE

Larger volume means we buy better and we pass the savings on to you. These are our proven, prime, branded 200 ns (yes, 200 nanosecond) chips. You will pay much more elsewhere for slow, 350 ns. chips. Ours are guaranteed for 12 months. A pair of DIP shunts is also required to upgrade the CPU memory in the TRS-80 – these cost an additional $4.00. All kits come complete with full, step-by-step instructions which include labelled photographs. No soldering is required. You do not have to be an experienced electronic technician to instal them.

DISK DRIVE CABLES SUITABLE FOR ANY DISK DRIVES

DC-2 2 Drive Connector Cable . . . . . $35 incl. p&p
DC-4 4 Drive Connector Cable . . . . . $45 incl. p&p

DOUBLE THE SPEED AND CAPACITY OF YOUR DISK DRIVES PERCOM DOUBLER ONLY $220 plus $2.00 p&p

Installing a Doubler is like buying another set of disk drives, only much cheaper!! The doubler works with most modern disk drives including:- MPI, Micropolis, Pertec, TEAC (as supplied by Tandy). The doubler installs in the TRS-80 expansion interface, the System-80 expansion interface and the LNW Research expansion interface in a few minutes without any soldering, cutting of tracks, etc. It comes complete with its own TRSDOS compatible double density operating system.

DOUBLE-ZAP II – DOUBLE DENSITY PATCH FOR NEWDOS 80 ONLY $53.00 plus $1.00 p&p

If you are using NEWDOS 80, then you also need DOUBLE-ZAP II, on diskette. This program upgrades your NEWDOS 80 to double density with ADR (automatic density recognition.) It retains all the familiar features, including the ability to mix and match track counts on the same cable. In addition, it gives NEWDOS 80 the ability to mix densities on the same cable, automatically. If you place a single density diskette in drive Ø, say and a double density diskette in drive 1, Double-ZapII will recognise this and read/write to drive Ø in single density whilst at the same time it reads/writes to drive 1 in double density!

FLOPPY DOCTOR AND MEMORY DIAGNOSTIC (by MICRO CLINIC) $29.95 plus 50c. p&p

Two machine language programs on a diskette together with manual which thoroughly test your disk drives and memory. There are 19 possible error messages in the disk drive test and their likely causes are explained in the manual. Each pass of the memory tests checks every address in RAM 520 times, including the space normally occupied by the diagnostic program itself. When an error occurs the address, expected data, and actual data are printed out together with a detailed error analysis showing the failing bit or bits, the corresponding IC's and their location. This is the most thorough test routine available for TRS-80 disk users.

BOOKS

LEVEL II ROM REFERENCE MANUAL $24.95 + $1.20 p&p

Over 70 pages packed full of useful information and sample programs. Applies to both TRS-80 and SYSTEM 80.

TRS-80 DISK AND OTHER MYSTERIES $24.95 + $1.20 p&p

The hottest selling TRS-80 book in the U.S.A. Disk file structures revealed, DOS's compared and explained, how to recover lost files, how to rebuild crashed directories – this is a must for the serious Disk user and is a perfect companion to any of the NEWDOS's.

LEARNING LEVEL II $16.95 + $1.20 p&p

Written by Daniel Lien, the author of the TRS-80 Level I Handbook, this book teaches you, step-by-step, how to get the most from your Level II machine. Invaluable supplement to either the TRS-80 Level II Manual or the System-80 Manuals.

HIGH QUALITY DISKETTES ALL PRICES INCLUDE P&P

40 TRACK NASHUA SINGLE SIDE/SINGLE DENSITY ... $45.00 box of 10

HIGH QU

40 TRACK VERBATIM DOUBLE S

SOFTWARE BY AUSTRALIAN AUTHORS

All our software is suitable for either the SYSTEM 80 or the TRS-80

NEW SOFTWARE FROM MICRO-80 PRODUCTS

BUSINESS PROGRAMS

MICROMANAGEMENT STOCK RECORDING SYSTEM (L2/16K)

Cassette version. . . . . $29.95 + $1.00 p&p
Stringy Floppy version. . . . . $33.95 + $1.00 p&p

This system has been in use for 9 months in a number of small retail businesses in Adelaide. It is therefore thoroughly debugged and has been tailor made to suit the requirements of a small business. MICROMANAGEMENT SRC enables you to monitor the current stock level and reorder levels of 500 different stock items per tape or wafer. It includes the following features:—

- — Add new items to inventory
- — Delete discontinued items from inventory
- — List complete file
- — Search for any stock number
- — Save data to cassette or wafer
- — Load data from cassette or wafer
- — Adjusts stock levels from sales results and receipt of goods
- — List all items requiring reordering

We can thoroughly recommend this program for the small business with a L2/16K computer.

SCOTCH BRAND COMPUTING CASSETTES

Super-quality personal computing cassettes.
C-10 pack of 10 ... ... $26.00 incl. p&p
C-30 pack of 10 ... ... $28.00 incl. p&p

UTILITIES

S-KEY by Edwin Paay $15.95 plus 50c. p&p

S-KEY is a complete keyboard driver routine for the TRS-80 and becomes part of the Level II basic interpreter. With S-KEY loaded the user will have many new features not available with the standard machine.

S-KEY features:

* S-KEY provides an auto-repeat for all the keys on the keyboard. If any key is held down longer than about half a second, the key will repeat until it is released.
* Graphic symbols can be typed direct from the keyboard, this includes all 64 graphic symbols available from the TRS-80/SYSTEM 80.
* S-KEY allows text, BASIC commands and/or graphics to be defined to shifted keys. This makes programming much easier as whole commands and statements can be recalled by typing shift and a letter key.
* Because S-KEY allows graphics to be typed directly from the keyboard, animation and fast graphics are easily implemented by typing the appropriate graphics symbols directly into PRINT statements.
* S-KEY allows the user to LIST a program with PRINT statements containing graphics, properly. S-KEY does this by intercepting the LIST routine when necessary.
* S-KEY allows the user to list an updated list of the shift key entries to the video display or line printer.
* S-KEY can be disabled and enabled when required. This allows other routines which take control of the keyboard to run with S-KEY as well.

Each cassette has TRS-80, DISK and SYSTEM 80 versions and comes with comprehensive documentation.

BMON by Edwin Paay $19.95 plus 50c. p&p
THE ULTIMATE HIGH MEMORY BASIC MONITOR L2/16-48K

Our own personnel refuse to write BASIC without first loading this amazing machine language utility program into high memory! BMON Renumbers; Displays BASIC programs on the screen while they are still loading; tells you the memory locations of the program just loaded; lets you stop a load part-way through; merges two programs, with automatic renumbering of the second so as to prevent any clashes of line numbers; recovers your program even though you did type NEW: makes one program invisible while you work on a second (saves hours of cassette time!); lists all the variables used in the program; makes SYSTEM tapes; lets you Edit memory directly . . . the list goes on and on. Cassette comes with 16K, 32K and 48K versions, ready to load. Can anyone afford NOT to have BMON?

EDUCATIONAL

RPN CALCULATOR (L2/16K & 32K)
$14.95 $ 50c. p&p

Give your computer the power of a $650 reverse polish notation calculator with 45 functions and selectable accuracy of 8 or 16 digits. The main stack and registers are continuously displayed whilst the menu is always instantly accessible without disturbing any calculations or register values. The cassette comes with both the 16K and 32K versions, the latter giving you the additional power of a programmable calculator. Comes with a very comprehensive 15 page manual, which includes instructions to load and modify the 32K programmable version to run in 16K. Whether for business or pleasure, this package will prove invaluable, and turn you '80 into a very powerful instrument.

GAMES

MICROPOLY (L2/16K) $7.50 $ 50c p&p

Now you can play Monopoly on your micro. The old favourite board game has moved into the electronic era. This computer version displays the board on the screen, obeys all the rules and, best of all, the banker does not make mistakes with your change!

CONCENTRATION (L2/16K) $7.50 + 50c p&p

Another application of supergraphics. There are 28 "cards" displayed on the screen, face down. Players take it in turn to turn them over with the object of finding matching pairs. There are 40 different patterns which are chosen at random, so the game is full of endless variety. This is of particular value in helping young children to learn the art of concentrating and, at the same time, to introduce them to the computer.

METEOR AND TORPEDO ALLEY (L2/16K)
$9.95 + 50c p&p

Those who frequent games arcades will recognize these two electronic games. In METEOR you must destroy the enemy space ships before they see you. In its most difficult mode, the odds are a thumping 238 to 1 against you being successful. In torpedo alley you must sink the enemy ships without hitting your own supply ship. Both games include sound effects and are remarkably accurate reproductions of the arcade games.

SKETTES

E DENSITY ... $59.00 box of 10

HIGH QUALITY DISKETTES

77 TRACK VERBATIM SINGLE SIDE/SINGLE DENSITY ... $59.00 box of 10

AUSTRALIAN SOFTWARE (Cont.)

GAMES

SHEEPDOG (L2/16K) **$7.50 + 50c p&p**

Ever wondered how a sheepdog manages to drive all those awkward sheep into a pen? Well, here is your chance to find out just how difficult it is and have a lot of fun at the same time. You control the sheepdog, the computer controls the sheep! As if that isn't enough, look out for the dingoes lurking in the bush!

U BOAT **$7.50 plus 50c p&p**

Real time simulation at its best! Comes with working sonar-screen and periscope, a full rack of torpedoes, plenty of targets, working fuel and battery meters, helpful Mothership for high-seas reprovisioning and even has emergency radio for that terrible moment when the depth charges put your crew at risk. Requires Level II/16K.

SPACE INVADERS WITH SOUND **$7.50 + 50c p&p**

Much improved version of this arcade favourite with redesigned laser and cannon blasts, high-speed cannon, 50 roving drone targets, 10 motherships and heaps of fun for all. Level II with 4K and 16K versions on this cassette.

GOLF (L2/16K) **$7.50 + 50c p&p**

Pit your skills of mini-golf against the computer. Choose the level of difficulty, the number of holes and whether you want to play straight mini golf or crazy golf. Complete with hazards, water traps, bunkers and trees. Great fun for kids of all ages.

DOMINOES(L2/16K) **$7.50 + 50c p&p**

Pit your skill at dominoes against the computer, which provides a tireless opponent. Another application of supergraphics from the stable of Charlie Bartlett. Dominoes are shown approximately life size in full detail (except for colour!). The monitor screen is a window which you can move from one end of the string of dominoes to the other. Best of all, you don't lose any pieces between games!

KID'S STUFF (formerly MMM-1) $7.50 plus 50c. p&p

Three games on one cassette from that master of TRS-80 graphics, Charlie Bartlett. Includes INDY 500, an exciting road race that gets faster and faster the longer you play, SUBHUNT in which your warship blows up unfortunate little submarines all over the place, and KNIEVEL (as in motorcycle, ramp and buses).

UPGRADE TO A 48K SYSTEM FOR ONLY $209! VIA THE MICROTEK MEMORY EXPANSION/PRINTER MODULE

Need more memory but don't want to pay over $600 for an expansion interface? Then the MICROTEK MT-32 memory expansion/printer module is for you. Ready to plug in and go, this module provides you with sockets for an extra 32K of ram in 16K blocks plus a printer port. It is housed in an attractive, grey and black metal cabinet of similar size to the Tandy expansion interface so that you can sit your monitor atop it. The MICROTEK unit runs from the same external power pack as the Tandy CPU. The Centronics parallel printer port enables you to run most printers including the Olivetti ET-121 with MICRO-80 interface. Full instructions for connecting to your system and adding memory chips are included.

MICROTEK MT32-A 0K $149
MICROTEK MT32-B 16K $179
MICROTEK MT32-C 32K $209

LOWER CASE FOR YOUR TRS-80/SYSTEM 80

Kit only $49.00 plus $2.00 p&p

Give your TRS-80 or SYSTEM 80 a lower case display with proper descenders and a block cursor (similar to the TRS-80 Model III). Also includes symbols for the four suits of cards. Includes full fitting instructions, all necessary components and a special machine language driver program to enable lower case in BASIC. The modification is similar to the Tandy model and does not work with Electric Pencil without further modifications.

These kits require disassembly of your computer and some soldering. They should only be installed by someone who has experience in soldering integrated circuits, using a low power, properly earthed soldering iron. If you do not have the necessary experience/equipment, we will install the modification for you for $20 plus freight in both directions. Make sure you arrange the installation with us first, before despatching your computer, so that we can assure you of a rapid turn-around. We are also arranging to have installers in each State. See elsewhere in this issue for their names and addresses.

PRICES

Cat No.
HD-020 Lower case mod kit for TRS-80
$49.00 plus $2.00 p&p
HD-021 Lower case mod kit for SYSTEM-80
$49.00 plus $2.00 p&p

EPSON MX-80 PRINTER

ONLY *$949 Inc. Cable for TRS-80 and p&p

(*Printer only — $940 incl. p&p)

The EPSON MX-80 printer is compact, quiet, has features unheard of only 2-3 years ago in a printer at any price and, above all, is ultra-reliable. All available print modes may be selected under software control. Features include:

- high quality 9x9 dot-matrix character formation
- 3 character densities
  - . 80 characters per line at 10 chars/inch
  - .132 characters per line at 16.5 chars/inch
  - . 40 characters per line at 5 chars/inch
- 2 line spacings
  - . 6 lines per inch . 8 lines per inch
- 80 characters per second print speed
- bi-directional printing
- logical seeking of shortest path for printing
- lower case with descenders
- TRS-80 graphics characters built in
- standard Centronics printer port

The bi-directional printing coupled with the logical seeking of the shortest print path (which means that the print head will commence printing the next line from the end which requires the least travel, thereby minimising unutilised time) gives this printer a much higher throughput rate than many other printers quoting print speeds of 120 c.p.s. or even higher.

GREEN SCREEN SIMULATOR

$19.95 incl. p&p

The GREEN SCREEN SIMULATOR is made from a deep green perspex, cut to fit your monitor. It improves contrast and is much more restful to the eyes than the normal grey and white image.

All editorial staff of MICRO-80 are now using GREEN SCREEN SIMULATORS on their own monitors.

Please make sure to specify whether you have an old (squarish) or new (rounded) style monitor when ordering. Not available for Dick Smith monitors.

NEW AUSTRALIAN SOFTWARE

All programs designed to run on both the TRS-80 or the SYSTEM 80 without modification. Most programs include sound

TRIAD VOL 1 – L2/16K

Cassette $9.95 Disk $14.95
+ 60c p&p

Three separate games which test your powers of memory and concentration. The programs combine graphic displays and sound:

SIMON-SEZ: Just like the electronic music puzzles on sale for more than $20. Numbers are flashed on the screen and sounded in a sequence determined by the computer. Your task is to reproduce the sequence, correctly.

LINE?: Rather like a super, complicated version of noughts and crosses. You may play against another player or against the computer itself. But beware, the computer cheats!

SUPER CONCENTRATION: Just like the card game but with more options. You must find the hidden pairs. You may play against other people, play against the computer, play on your own, or even let the '80 play on its own.

TRIAD VOL 2 – L2/16K

Cassette $9.95 Disk $14.95
+ 60c p&p

Remember those "NUMERO" puzzles in which you had a matrix of numbers (or letters) with one blank space and you had to shuffle the numbers around one at a time until you had made a particular pattern? Well, **SHUFFLEBOARD**, the first program in this triad, is just this, except that the computer counts the number of moves you take to match the pattern it has generated – so it is not possible to cheat.

MIMIC is just like SHUFFLEBOARD except that you only see the computer's pattern for a brief span at the beginning of the game, then you must remember it!

In **MATCHEM**, you have to manoeuvre 20 pegs from the centre of the screen to their respective holes in the top or bottom rows. Your score is determined by the time taken to select a peg, the route taken from the centre of the screen to the hole and your ability to direct the peg into the hole without hitting any other peg or the boundary.

VISURAMA L2/16K

Cassette $9.95 Disk $14.95
+ 60c p&p

Two programs which give fascinating, ever-changing patterns on the screen.

LIFE is the fastest implementation of the Game of Life you will see on your '80. Machine language routines create up to 1200 new generations per minute for small patterns or up to 100 per minute for the full 128 x 48 screen matrix. Features full horizontal and vertical wraparound.

EPICYCLES will fascinate you for hours. The ever-changing ever-moving patterns give a 3D effect and were inspired by the ancient Greek theories of Ptolemy and his model of the Solar system.

EDUCATION AND FUN – L1/4K, L2/16K

Cassette $9.95 Disk $14.95
+ 60c p&p

Written by a primary school teacher to make learning enjoyable for his pupils, there are five programs in both Level I and Level II to suit all systems:

BUG-A-LUG: a mathematics game, in which you must get the sum correct before you can move.

AUSTRALIAN GEOGRAPHY: learn about Australian States and towns, etc.

SUBTRACTION GAME: build a tower with correct answers.

HOW GOOD IS YOUR MATHS? Select the function (+, –, ÷ or X) and degree of difficulty.

HANGMAN: That well known word game now on your computer.

Recommended for children from 6 to 9 years.

COSMIC FIGHTER & SPACE JUNK – L2/16K

Cassette $9.95 Disk $14.95
+ 60c p&p

Both programs have sound to complement their excellent graphics. In **COSMIC FIGHTER**, you must defend the earth against seven different types of alien aircraft. It is unlikely that you will be successful but you will have a lot of fun trying!

You mission in **SPACE JUNK** is to clean up all the debris left floating around in space by those other space games. It is not as simple as it sounds and space junk can be quite dangerous unless you are very careful.

SPACE DRIVE L2/4K & 16K

Cassette $7.95 Disk $12.95
+ 60c p&p

Try to manoeuvre your space ship through the meteor storms then land it carefully at the space port without running out of fuel or crashing. Complete with realistic graphics.

STARFIRE AND NOVA INVASION L2/16K

Cassette $9.95 Disk $14.95
+ 60c p&p

Both programs include sound to improve their realism.

STARFIRE seats you in the cockpit of an X-wing fighter as you engage in battle with the deadly Darth Vader's Tie-fighters. Beware of the evil one himself and may the Force be with you.

In **NOVA INVASION**, you must protect your home planet of Hiberna from the invading NOVADIANS. You have two fixed guns at each side of the screen and a moveable one at the bottom. Apart from shooting down as many invaders as possible, you must protect your precious hoard of Vitaminium or perish!

AIR ATTACK AND NAG RACE – L2/16K

Cassette $9.95 Disk $14.95
+ 60c p&p

An unlikely combination of programs but they share the same author who has a keen sense of humour.

AIR ATTACK includes sound and realistic graphics. The aircraft even have rotating propellors! But they also drop bombs on you, so it's kill or be killed!

NAG RACE lets you pander to your gambling instinct without actually losing real money. Up to five punters can join in the fun. Each race results in a photo-finish whilst there is a visible race commentary at the bottom of the screen throughout the race. Happy punting!

FOUR LETTER MASTERMIND L2/16K

Cassette $7.95 Disk $12.95
+ 60c p&p

There are 550 four-letter words from which the computer can make its choice. You have 12 chances to enter the correct word. After each try, the computer informs you of the number of correct letters and those in the correct position. You can peek at the list of possible words but it will cost you points. Makes learning to spell fun.

MUSIC IV – L2/16K

Cassette $7.95 Disk $12.95
+ 60c p&p

Music IV is a music compiler for your '80. It allows you to compose or reproduce music with your computer that will surprise you with its range and quality. You have control over duration (full beat to 1/16 beat) with modifications to extend the duration by half or one third for triplets. Both sharps and flats are catered for as are rests. Notes on whole sections may be repeated. The program comes with sample data for a well-known tune to illustrate how it is done.

*****SAVE 00$'s ***SAVE 00$'s ***SAVE 00$'s ***MICRO-80 EXPANSION INTERFACE *****

MICRO-80's expansion interface utilises the proven LNW Research Expansion board. It is supplied fully built up and tested in an attractive cabinet with a self contained power supply, ready to plug in and go. The expansion interface carries MICRO-80's full, no hassle, 90-day warranty.

Features include:- • Sockets for up to 32K of memory expansion • Disk controller for up to 4 disk drives • Parallel printer port • Serial RS232C/20mA I/O port • Second cassette (optional)

The expansion interface connects directly to your TRS-80 L2/16K keyboard or, via SYSPAND-80 to your SYSTEM-80VIDEO GENIE

Prices: HD-010-A Expansion Interfaces with Ø K : $415.00 HD-010-B Expansion Interfaces with 32K : $475.00 HD-011 Data separator fitted (recommended) : add $25.00 HD-012 Dual cassette Interfaces fitted : add $15.00.

The MICRO-80 Expansion Interface is also available in kit form.

Prices: HD-013 Kit consisting of LNW Research PC board and manual, ALL components including cabinet & power supply : $335.00 HD-011 Data separator for above : $22.00 HD-013 Dual cassette Interface kit : $12.00.

TURN THIS into this

for $49.00 plus $2.00 p & p

A choice of upper and lower case display is easier to read, gives greater versatility.

The Micro-80 lower case modification gives you this facility, plus the symbols for the 4 playing-card suits for $49.00 + $2.00 p. & p.

The Micro-80 modification features true below-the-line descenders and a block cursor.

Each kit comes with comprehensive fitting instructions and two universal lower-case drive routines on cassette to enable you to display lower case in BASIC programs.

The driver routines are self-relocating, self-protecting and will co-reside with other machine language programs such as Keyboard-debounce, serial interface driver programs etc.

Both programs give your TRS-80™ Model I or System 80™ an optional typewriter capability, i.e. shift for upper case.

The second programme also includes Keyboard-debounce and a flashing cursor.

You fit it. Or we can.

Fitting the modification requires soldering inside the computer. This should only be carried out by an experienced hobbyist or technician.

If you are at all dubious, a fitting service is available in all capital cities for only $20.00.

A list of installers is included with each kit.

Save $120 now.

ADD A DISK DRIVE TO YOUR TRS-80™ MODEL III FOR ONLY $875.00 OR ADD TWO FOR ONLY $1199.

The Micro-80 disk drive upgrade for the TRS-80™ Model III contains the following high quality components:

1 or 2 MPI 40-track single head disk drives, 1 VR Data double-density disk controller board and 1 dual drive power supply plus all the necessary mounting hardware, cables and comprehensive fitting instructions, which can be carried out with a minimum of fuss by any average computer owner.

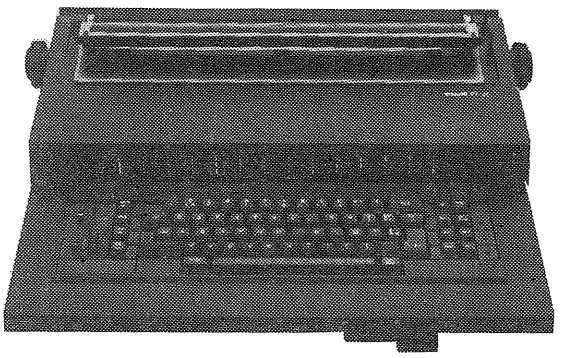
Fitting service is available for $25.00 in most capital cities.

Daisy Wheel Typewriter/Printer

ONLY $1995 INC. S.T.

MICRO-80 has converted the new OLIVETTI ET-121 DAISY WHEEL typewriter to work with the TRS-80 and SYSTEM 80 or any other microcomputer with a Centronics parallel port (RS 232 serial interface available shortly). The ET-121 typewriter is renowned for its high quality, fast speed (17 c.p.s.), quietness and reliability. MICRO-80 is renowned for its knowledge of the TRS-80/SYSTEM 80 and its sensible pricing policy. Together, we have produced a dual-purpose machine:- an attractive, modern, correcting typewriter which doubles as a correspondence quality Daisy-wheel printer when used with your micro-computer.

How good is it? - This part of our advertisement was typeset using an ET-121 driven by a TRS-80. Write and ask for full details.



```
  ********************************************
  * VARIABLE WORKSHEET - FOR THE TRS-80 *
  *      S & P MILLER      : P.O.BOX 37-130 *
  *      STOKES VALLEY     : NEW ZEALAND    *
  ********************************************

10 CLEAR 1000
20 CLS
30 PRINT @ 70,"VARIABLE WORKSHEET "
40 PRINT TAB(30)"BY S & P MILLER - FOR T
HE TRS-80"
50 PRINT
60 PRINT
70 PRINT
80 INPUT"ENTER MAX. NUMBER OF ARRAYS   ";
A
90 INPUT"ENTER MAX. NUMBER OF SUBROUTINE
 LINES REQUIRED   ";B
100 INPUT"ENTER MAX. NUMBER OF VARIABLE
LINES REQUIRED   ";C
110 INPUT"ENTER NUMBER OF COPIES REQUIRE
D   ";Y
120 FOR J=1 TO Y
130 LPRINT CHR$(27)CHR$(14)"VARIABLE WOR
KSHEET"
140 LPRINT"PROGRAM :  ",,"PROGRAMMER :",,
"DATE :   /  /19   :"
150 LPRINT" "
160 LPRINT"MEMORY CLEARED -                ME
MORY PROTECTION AT - "
170 LPRINT" "
180 LPRINT"LIST OF TYPE DEFINITIONS :-"
190 LPRINT" "
200 LPRINT" DEFSTR ---  "
210 LPRINT" DEFINT ---  "
220 LPRINT" DEFSNG ---  "
230 LPRINT" DEFDBL ---  "
240 LPRINT" "
250 LPRINT" "
260 LPRINT"LIST OF DIMENSIONED ARRAYS :-
"
270 FOR X=1 TO A
280 LPRINT" DIM    (    )    : NAME :"
290 NEXT X
300 LPRINT" "
310 LPRINT"SUBROUTINE INFORMATION :-"
320 LPRINT" "
330 LPRINT" START #:   END # : COMMENTS "
340 LPRINT" "
350 FOR X=1 TO B
360 LPRINT" -------  ";":":";" -------  ";":  "
;
370 LPRINT STRING$(41,"-")
380 NEXT X
390 LPRINT" "
400 LPRINT"VARIABLE LIST :-"
410 LPRINT" "
420 LPRINT" NAME                      LABEL/US
E"
430 LPRINT" "
440 FOR X=1 TO C
450 LPRINT"   ---",
460 LPRINT STRING$(44,"-")
470 NEXT X
480 LPRINT" "
490 LPRINT"PERIPHERALS REQUIRED :-"
500 LPRINT" "
510 LPRINT" CASSETTE # 1  (  ):CASSETTE #
2  (  ):PRINTER  (  )  :DISCS  (  ) NUMBER REQU
IRED  --  "
520 LPRINT"NOTES:-  "
530 LPRINT" "
540 LPRINT" "
550 LPRINT" "
560 NEXT J
```

```
570 CLEAR 50
580 '          VARIABLE LIST:-
              A : NUMBER OF ARRAY LINES
              B :     "     "  SUBROUTINE LINES
              C :     "     "  VARIABLE LINES
590 '         Y :     "     "  COPIES REQUIRED
              J : LOOP COUNTER FOR COPIES
              X :   "          "      "   A,B AND C
```

***** GRAND PRIX LII/16K (C) Stephen Humphry *****

Just about everyone will have seen this popular game in the video arcades. The player is travelling in a car on a "TWO WAY" road (ie: where cars may come from the other direction). The player begins in the LEFT lane and must pass all the vehicles in that lane. To pass a vehicle, the player presses the ")" key, (no shift key required), to change to the RIGHT lane and remains there until the vehicle is passed. The player then must change back to the LEFT lane by pressing " " (no shift). The object of this game is to execute this manoeuvre as quickly as possible since a car could be travelling down the RIGHT lane. Each player plays against a high score. The game ends when a player collides with an oncoming vehicle in the RIGHT lane or a vehicle he is attempting to pass. The greater the distance travelled by the player prior to his collision, the greater his score.

```
**********************************************
*     GRAND PRIX - BY STEPHEN HUMPHRY        *
* 10 BAINTON CRESCENT MELBA, ACT 2617        *
**********************************************
70 HS=0:CLS:PRINTCHR$(23):PRINT@520,"***
   GRAND   PRIX   ***";:
FORX=1TO20:PRINT@520,"     ";:PRINT@556,"
   ";:FORG=1TO20:NEXTG:
PRINT@520,"***";:PRINT@556,"***";:NEXTX
80 H=0:CLS:FLAG=0:F1=0:RANDOM:FORY=0TO89
6DSTEP64:PRINT@Y,;:
FORX=1TO10:PRINTCHR$(191);:NEXTX:NEXTY:F
ORX=0TO19:FORY=45TO47:
SET(X,Y):NEXTY:NEXTX:FORY=54TO950STEP64:
PRINT@Y,;:FORX=1TO10:
PRINTCHR$(191);:NEXTX:NEXTY:F=148
90 FORX=108TO127:FORY=45TO47:SET(X,Y):NE
XTY:NEXTX:GOSUB290:
FORX=96TO928STEP256:PRINT@X,CHR$(191);:N
EXTX:FORJ=1TO500:NEXTJ
100 FORX=96TO928STEP256:PRINT@X,CHR$(191
);:NEXTX:H=H+1:
GOSUB250:FORX=96TO928STEP256:PRINT@X,CHR
$(128);:NEXTX:
GOSUB250
110 FORX=224TO992STEP256:PRINT@X,CHR$(19
1);:NEXTX:GOSUB250:
FORX=224TO992STEP256:PRINT@X,CHR$(128);:
NEXTX:GOSUB250
120 IFFLAG=1THEN170:IFF1=1THEN130:K=RND(
3):IFK<>1THEN100:F1=1:
F=148
130 IFF<595THEN160
140 IFFLAG=0THEN310ELSEPRINT@F,CHR$(128)
;CHR$(128);:
PRINT@F+256,CHR$(187);CHR$(183);:PRINT@F
+256,CHR$(128);
CHR$(128);:F1=0:F=148
150 GOTO 100
160 F=F+128:PRINT@F-128,CHR$(128);CHR$(1
28);:PRINT@F,
CHR$(187);CHR$(183);:F1=1:GOTO100
170 IF F1 = 0 THEN 190
180 PRINT@F,CHR$(128);CHR$(128);:PRINT@F
+256,CHR$(187);
CHR$(183);:PRINT@F+256,CHR$(128);CHR$(12
8);:
F1=0:F=148
```

```
190 IFF1=0THEN230:IFF=660THEN310:PRINT@F
,CHR$(128);CHR$(128)
:PRINT@F+256,CHR$(187);CHR$(183);:PRINT@
F+256,CHR$(128);
CHR$(128);
200 IFF<659THEN130:D=RND(15):IFD<>1THEN1
00:T=170
210 T = T + 128
220 PRINT@T,CHR$(187);CHR$(183);:PRINT@T
-128,CHR$(128);
CHR$(128);:IFT < 681 THEN 210 ELSE GOTO
310
230 D=RND(5):IFD<>1THEN100ELSET=170
240 GOTO 220
250 Z$ = INKEY$
260 IF Z$ = "," THEN GOSUB 290
270 IF Z$ = "." THEN GOSUB 300
280 RETURN
290 PRINT@681,;:FORX=1TO4:PRINTCHR$(128)
;:NEXTX:PRINT@617,
CHR$(128);:PRINT@620,CHR$(128);:PRINT@65
9,;CHR$(176);
CHR$(143);CHR$(143);CHR$(176);:PRINT@595
,CHR$(176);:PRINT@
598,CHR$(176);:FLAG=0:RETURN
300 PRINT@659,;:FORX=1TO4:PRINTCHR$(128)
;:NEXTX:PRINT@595,
CHR$(128);:PRINT@598,CHR$(128);:PRINT@68
1,CHR$(176);CHR$(143);
CHR$(143);CHR$(176);:PRINT@617,CHR$(176)
;:PRINT@620,CHR$(176);
:FLAG=1:RETURN
310 CLS:PRINTCHR$(23):FORG=1TO7:PRINT:NE
XTG:PRINTTAB(4);
"C R A S H";:FORJ=1TO500:NEX
TJ:CLS:PRINTCHR$(23);
320 FORJ=1TO5:PRINT:NEXTJ:PRINT"G A M E
 O V E R"
330 PRINT:PRINT:PRINT"YOUR SCORE : ";H :
 IF H>HS THEN HS=H
340 PRINT"HIGH SCORE : ";HS :PRINT:PRINT
"ANOTHER GAME <Y/N>"
350 Z$=INKEY$
360 IF Z$ = "Y" THEN 80
370 IF Z$ <> "N" THEN 350
380 CLS:END
```

***** METRIC TIME LII/4K (C) Frank Kosztelnik *****

This program just had to go in the April issue of the magazine, it's probably the only time of year that we could convince you that it was going to be introduced by the government, (as one T.V. station tried to make us believe recently). (even that's a joke, considering our publication dates - Ed.). It is quite an interesting prospect when considered in everyday life. The program works on the basis of ten hours to the day, 100 minutes to the hour and 100 seconds to the minute. As an example :- noon (12 o'clock) would be 5.0000 hours, (where the first two numbers after the decimal point would be metric minutes and the next two numbers would be metric seconds). Instead of working from 9 o'clock to 5 o'clock, in metric you would work from 3.7499 to 7.0833 (or after the unions have finished), from 4.0000 to 7.0000, (9:36 to 16:48 imperial time). The applications where metric time would be advantageuos compared with the old system are numerous, from scientific uses to being easier to teach the children. Of course metric time will never happen, if only because the conversion of clocks would be too large a job. Just imagine Big Ben with a digital readout !

The program simply converts one system of time to another. Times entered must be in a 24 hour clock format, ie. the imperial time of 8:36 p.m. would be entered as 20:36 and would be entered into the computer as 20,36,00 (with the commas, of course). Doing it the other way round, (metric to imperial), you would enter the metric time of 3.7499 as 3,74,99 (once again with the commas). There may never be a practical use for this program but it is, nevertheless, interesting to see the times that rule our lives converted into metric and to ponder what life would be like if some fluke of history had given us metric time.

```
10 ' METRIC TIME CONVERSION (BIT OF A JO
KE)
20 ' FRANK KOSZTELNIK 11 CARRINGTON AVEN
UE KATOOMBA N.S.W 2780
30 CLEAR64:A$=STRING$(64,CHR$(140))
40 CLS:PRINT"THIS PROGRAM CONVERTS TIME
FROM METRIC TO IMPERIAL OR IMPERIAL TO
METRIC."
50 PRINT"IT IS ON THE BASIS OF 10 METRIC
 HOURS PER DAY, 100 METRIC MINUTES
 PER METRIC HOUR AND 100 METRIC SECONDS
PER METRIC MINUTE..."
60 PRINTA$:GOTO80
70 CLS:PRINTA$
80 PRINT:PRINT"ENTER 1 FOR IMPERIAL TO M
ETRIC CONVERSION"
90 PRINT"ENTER 2 FOR METRIC TO IMPERIAL
CONVERSION"
100 INPUTA:ONAGOTO110,170:GOTO80
110 CLS:PRINT:PRINT"ENTER TIME ON A 24 H
OUR (IMPERIAL) BASIS IN HOURS, MINUTES,
    SECONDS":INPUTH,M,S:IFH>24ORH<0GOTO1
10
120 DH=H+(M/60)+(S/3600)
130 MT=DH/2.4
140 M1=INT(MT):T=(MT-M1)*100:M2=INT(T):M
3=INT((T-M2)*100)
150 PRINT:PRINT"METRIC TIME IS ";M1;"MET
RIC HOURS ";M2;"METRIC MINUTES ";M3;"MET
RIC SECONDS":PRINT"OR..."MT;"METRIC HOU
RS"
160 PRINT:INPUT"ENTER WHEN READY";B:GOTO
70
170 CLS:PRINT:PRINT"ENTER TIME ON A 10 H
OUR BASIS (METRIC) IN HOURS, MINUTES,
    SECONDS":INPUTM1,M2,M3:IFM1>100RM1<0
GOTO170
180 MT=M1+(M2/100)+(M3/10000)
190 DH=MT*2.4
200 H=INT(DH):T=(DH-H)*60:M=INT(T):S=INT
((T-M)*60)
210 PRINT:PRINT"IMPERIAL TIME IS ";H;"HO
URS ";M;"MINUTES ";S;"SECONDS"
220 PRINT:INPUT"ENTER WHEN READY";B:GOTO
70
```

***** 80 COMPOSER LII/16K (C) R. T. Griffin *****

This program allows the user to write into memory up to 1000 notes of music using a scale ranging from middle C to the second G above middle C, includi g the sharps and flats between them. Two modifiers are used to give half and quarter length note durations in addition to single length duration which is the default condition.

Some knowledge of music is necessary to use this program and these instruction assume that the reader already has a basic knowledge.

The program includes control functions to allow the user to repeat a series of notes already input, to backspace and delete the last n notes entered, to display the beginning and end of the resultant m/l program to enable a BMON dump for saving the tune on tape, (if you have BMON), to play the tune already input and start again. The display shows the standard music bars with the note names in their correct positions and a note counter which allows correct backspacing and repetition of sequences. Instructions are displayed at start up and may be recalled at any time. Full instructions reside in REM statements at the beginning and end of the program along with a description of how it all works.

Type in the LISTing, CSAVE it and then follow the procedure below to use it:-

1) Answer MEMORY SIZE with 27100

2) Load in BMON (if you have it)

3) CLOAD the program and RUN it

The program outputs sound to both the TRS-80 and the SYSTEM 80/VIDEO GENIE computers. You may hear the sound through the external cassette deck by removing all the plugs from the recorder, inserting the plug which normally goes into the AUXiliary socket into the MIC socket, removing the cassette from the recorder, turning the volume right up and pressing down the PLAY key. Don't forget to reset the volume control before attempting to CLOAD another program! Alternatively, you may use an external amplifier instead.

A summary of the available commands is listed below:-

M = Display the parameters for a BMON dump.
X = Backspace and delete.
R = Repeat a section of music
P = Play music
I = Instructions recall
S = Wipe tune and restart
H = Half note duration
Q = Quarter note duration

Although BMON is needed to make a permanent record of your tune on tape in SYSTEM format, the program will still run and play music withot it. (BMON is a machine language monitor program LISTed in MICRO-80 issues 4 & 5 or available in an improved version from MICRO-80 PRODUCTS for $19.95 plus $.50 p&p). You may, of course, make an audio recording on your cassette recorder and play that back at any time. MEMORY SIZE must still be set whether you load BMON or not. When the M command is used the dump parameters will be displayd in decimal, you should note these values down on a piece of paper and use BMON to convert them to HEX for dumping to tape by BMON.

Typical inputs with explanations are listed below:-

# = a sharp
H = half note duration
D2#H = middle D sharp with a half note duration.
D#H = bottom D sharp with a half not duration.
DH = bottom D with a half note duration.
D = bottom D with a default full note duration
C2#Q = middle C sharp with a quarter note duration.
C#Q = bottom C sharp with a quarter note duration.
CQ = bottom C with a quarter note duration.
C = bottom C with a default full note duration.

Without getting into some very detailed explanations of the theory of music, if you are copying from a music book and you are not really familiar with musical notation then the following information may be helpful.

If the music you are entering requires you to enter a FLAT note, (represented by a symbol resembling a lower case "b" sometimes written next to the note that is to be flat or next to the stave on the line representing that note), then select the note to be entered into the program from the table below. They will create exactly the same tone because they are the same except for their names. No, I am not going to explain why, you'll just have to take my word for it or buy a book on musical notation. (Music has many similarities to computer languages, signs and letters represent different actions to be taken). If the interest is there, it is not much harder to learn to read music than to read BASIC. It only starts getting harder when you come to put it into practice, playing an instrument.

IF THE MUSIC SAYS	YOU TYPE IN
D flat	C sharp
E flat	D sharp
F flat	E *
G flat	F sharp
A flat	sharp
B flat	Asharp
C flat	B *

* NOTE: not a typing error, F flat does equal E and C flat does equal B. Next time you are near a piano, study the way the keys are set out. (They are not even, black, white, black, white, are they ?). If you haven't caught on yet, yours truly (that's Charlie Bartlett - Ed.) used to play an instrument (saxophone) before getting hooked on computers, which rather gives me an unfair advantage over those readers who are struggling to follow all this. So to get you started, here is a well known tune already worked out for you. Just type in the following and play it - eat your heart out Bach !!!

```
READ AND ENTER THE NOTES FROM LEFT TO RIGHT
C2Q   C2Q   E2Q   G2Q   CH    A2   F2Q  F2Q   G2Q   A2Q

G2    C2Q   C2Q   E2Q   G2Q   G2   D2   E2Q   F2Q   E2Q

D2Q   C2    C2
```

```
80 COMPOSER BY ROBYN AND TERRY GRIFFIN
   C/- 12 HALL ST TEXAS  QUEENSLAND.
20 '
          I N S T R U C T I O N S
30 '
SET MEMORY SIZE TO 27100 BEFORE YOU
LOAD OR RUN THIS, EVEN IF YOU ARE NOT
GOING TO USE BMON WITH IT.  BMON WILL
ALLOW A M/L DUMP OF YOUR TUNE, WHICH
MAY THEN BE LOADED AND PLAYED BY ITSELF
40 '
THE DUMP PARAMETERS WILL BE DISPLAYED
WHEN YOU INPUT 'M'.   WRITE THE DECIMAL
NUMBERS DOWN AND USE BMON TO CONVERT
THEM TO HEX.  YOUR TUNE MAY CONSIST OF
UP TO ONE THOUSAND (YES,1000)    NOTES.
50 '
WHEN 'X' IS INPUT, YOU CAN BACKSPACE
ANY NUMBER OF NOTES.    THE NOTES
BACKSPACED OVER WILL BE ERASED, AND
THE NOTE COUNTER DECREMENTED.  YOU CAN
THEN CONTINUE WRITING YOUR TUNE.
60 '
IF YOU WISH TO REPEAT A PARTICULAR
GROUP OF NOTES ANYWHERE IN THE TUNE,
INPUT 'R'.  YOU WILL THEN BE ASKED
FOR THE FIRST NOTE AND THEN THE LAST
NOTE OF THE SEQUENCE, WHICH WILL THEN
BE INSERTED AUTOMATICALLY.
70 '
THE OTHER TWO OPTIONS, 'P' AND 'I' ARE
SELF-EXPLANATORY FROM THE DISPLAY.
NOTE, HOWEVER, THAT YOU CAN PLAY THE
TUNE OR PART THEREOF AT ANY TIME
WITHOUT DAMAGING THE TUNE OR BREAKING
THE  PROGRAM FLOW.
80 '
THIS IS ALSO TRUE FOR THE OTHER PROGRAM
COMMANDS.  WHEN YOU BREAK THE PROGRAM
TO DO A BMON DUMP, YOU CANNOT
CONTINUE WRITING WHERE YOU LEFT OFF.
```

```
100 '       HAPPY COMPOSING FROM
          ROBYN AND TERRY GRIFFIN
110 DATA62,16,211,254,221,33,18,106,221,
78,0,121,183,200,221,70,1,62,5,211,255,1
6,254,221,70,1,62,6,211,255,16,254,13,19
4,234,105,221,35,221,35,1,255,255,33,48,
0,9,218,10,106,195,228,105
120 CLEAR1000:POKE16526,220:POKE16527,10
5:FORK=27100TO27152:READ Y:POKEK,Y:NEXT
130 DIMN$(21),D(21),F(21),H$(6)
140 DATAC,86,255,C#,91,240,D,96,228,D#,1
02,216,E,109,201,F,114,191,F#,121,181,G,
129,170,G#,137,160,A,145,151,A#,152,144
150 DATAB,161,136,C2,170,129,C2#,180,122
,D2,194,113,D2#,205,107,E2,215,102,F2,22
8,96,F2#,244,90,G2,255,86,END,0,0
160 CLS:FORX=128TO640STEP128
170 PRINT@X,STRING$(64,CHR$(140));:NEXTX
180 PRINT@768,STRING$(9,CHR$(140));
190 PRINT@724,"P=PLAY    R=REPEAT    X=ERA
SE   S=RESTART";
200 PRINT@788,"M=DUMP PARAMETERS    I=INS
TRUCTION RECALL";
```

```
210 Z=832:PRINT@20,"'  8 0    C O M P O S
E R";
220 FORC=1TO21
230 READN$(C):READD(C):READF(C):NEXT
240 FORC=1TO20
250 IFRIGHT$(N$(C),1)="#"THEN10Z=Z+3ELSE
10Z=Z-61
260 PRINT@Z,N$(C);:NEXT
270 PRINT@491,"MEMORY USED = 0     ";:PRIN
T@619,"MEMORY LEFT = 1000";
280 P=27152:GOSUB520
290 PRINT@896,STRING$(127," ");:PRINT@89
6,"INPUT NOTE OR INSTRUCTION";
300 H=0:Q=0:INPUTK$:PRINT@832,STRING$(12
7," ");
310 IFRIGHT$(K$,1)="H"THEN10H=1:K$=LEFT$
(K$,LEN(K$)-1)
320 IFRIGHT$(K$,1)="Q"THEN10Q=1:K$=LEFT$
(K$,LEN(K$)-1)
330 FORC=1TO21:IFN$(C)="END"THEN390ELSE1
0IFN$(C)<>K$THEN10NEXT
340 N=N+2:IFN>=200ZGOTO620
350 D=D(C)
360 IFH=1THEN10D=INT(D/2)
370 IFQ=1THEN10D=INT((D/4)+.5)
380 POKEP+N,D:POKEP+N+1,F(C):POKEP+N+2,0
:GOSUB610:GOTO290
390 IFK$="X"GOTO460
400 IFK$="P"GOTO480
410 IFK$="S"GOTO490
420 IFK$="I"GOTO500
430 IFK$="M"GOTO510
440 IFK$="R"GOTO630
450 PRINT@896,"INVALID INPUT
      ";:FORT=1TO1000:NEXTT:GOTO290
460 PRINT@896,"INPUT THE NUMBER OF NOTES
 YOU WANT TO ERASE ";:INPUTR:R=R*2:IFR>N
GOTO470ELSE10N=N-R:POKEP+N+2,0:GOSUB610:
GOTO290
470 PRINT@896,"YOU HAVEN'T ENTERED THAT
MANY NOTES!!                          ";
:FORT=1TO2000:NEXTT:GOTO290
480 W=USR(0):GOTO290
490 N=0:GOSUB610:POKEP+N+2,0:GOTO290
500 GOSUB520:GOTO290
510 PRINT@832,"DUMP PARAMETERS ARE: STAR
T = 27100  END="P+N+2" ENTRY = 27100";:G
OTO290
520 PRINT@832,STRING$(128," ");:PRINT@83
2,"1. FIND A TUNE WITHIN ABOVE FREQUENCY
 RANGE.";:GOSUB580
530 PRINT@832,"2. INPUT THE TUNE, ONE NO
TE AT A TIME, USING THE LABELS ABOVE.";:
GOSUB580
540 PRINT@832,"3. FOR A HALF-LENGTH NOTE
, SUFFIX WITH 'H', E.G. 'D2#H'.";:GOSUB5
80
550 PRINT@832,"4. FOR A QUARTER-LENGTH N
OTE, SUFFIX WITH 'Q', E.G. 'F#Q'.";:GOSU
B580
560 PRINT@832,"5. FOR PROGRAM CONTROL, U
SE THE KEY LETTERS ABOVE.";:GOSUB580
570 PRINT@832,"6. CONNECT YOUR AMPLIFIER
 TO THE 'MICROPHONE' LEAD OF YOUR '80.";
580 PRINT@916,"PRESS ANY KEY TO CONTINUE
";
590 Z$=INKEY$:IFZ$=""THEN590ELSE600
600 PRINT@832,STRING$(128," ");:RETURN
610 PRINT@504,INT(N/2);:PRINT@632,INT(10
00-(N/2)+.5);:RETURN
620 PRINT@896,"SORRY, YOU HAVE INPUT ALL
 THE NOTES I CAN HANDLE.";:FORT=1TO2000:
NEXTT:GOTO290
630 PRINT@896,"INPUT START NO. OF SEQUEN
CE TO BE REPEATED";:INPUTS:IFS<1GOTO690E
LSE10IFS>(N/2)GOTO690
```

```
640 PRINT@896,"INPUT FINAL NO. OF SEQUEN
CE TO BE REPEATED";:INPUTF:IFF<=SGOTO630
ELSE10IFF>(N/2)GOTO690
650 Y=(F+1-S)*2:IFY>NGOTO690
660 U=P+(S*2)-1
670 FORT=OTOY:U=U+1:V=PEEK(U):N=N+1:IFN>
2000POKEP+N+1,0:GOTO690
680 POKEP+N+1,V:GOSUB610:NEXT:POKEP+N+1,
0:GOSUB610:N=N-1:GOTO290
690 PRINT@896,STRING$(127," ");:PRINT@89
6,"FAIR GO, MATE, I'M ONLY HUMAN!!!!";:F
ORT=1TO2000:NEXTT:GOTO290
```

DESCRIPTION OF PROGRAM

THIS PROGRAM CONVERTS THE TUNE YOU HAVE ENTERED INTO MACHINE LANGUAGE WHICH RESIDES IN MEMORY LOCATIONS 27100 TO 27154. THE DATA ON WHICH THE MACHINE LANGUAGE PROGRAM OPERATES TO PRODUCE THE NOTES YOU ENTER, RESIDE IN LOCATIONS 27155 UP TO A MAXIMUM OF 29155. THIS MEANS THAT, UNLESS YOU SPECIFY MEMORY SIZE ON START-UP, YOU WILL DESTROY THE BASIC PROGRAM. THEREFORE, WHETHER OR NOT YOU HAVE BMON, YOU MUST ANSWER MEMORY SIZE? OR READY? WITH 27100 TO PROTECT THE MACHINE LANGUAGE PROGRAM AND DATA.

THERE IS NO NEED TO CSAVE THIS PROGRAM BEFORE YOU RUN IT AND IT CAN BE RE-RUN AT ANY TIME WITH NO FURTHER CHANGES.

THE TUNE WILL BE OUTPUT TO THE SINGLE CASSETTE OF A TRS-80 OR THE EXTERNAL CASSETTE OF A SYSTEM 80/VIDEO GENIE. THIS IS ACHIEVED BY:-

1) THE FIRST FOUR BYTES IN THE DATA STATEMENT IN LINE 10, SET BIT 4, PORT FE TO A 1. THIS, ON A SYSTEM 80/VIDEO GENIE, SPECIFIES THE EXTERNAL CASSETTE WHEN THE MOTOR DRIVE IS SWITCHED ON BUT HAS NO EFFECT ON A TRS-80.

2) INSTEAD OF TOGGLING ONLY BITS 0 AND 1 OF PORT FF TO PRODUCE THE SOUND, BIT 2 IS SET PERMANENTLY ON, THUS SWITCHING ON THE CASSETTE DRIVE MOTOR.

THUS, REGARDLESS OF WHETHER YOU USE THIS PROGRAM IN A TRS-80 OR A SYSTEM 80/VIDEO GENIE, YOU WILL GET THE SOUND OUTPUT ON THE "MIC" LEAD OF YOUR '80. ALSO, A M/L DUMP OF YOUR TUNE WILL PLAY IN EITHER TYPE OF '80.

THE BASIC PROGRAM

LINE 20 POKES THE M/L PROGRAM INTO PROTECTED MEMORY.

LINES 40 & 50 HOLD THE NAMES, DURATIONS AND FREQUENCIES OF THE NOTES WHICH ARE PUT INTO ARRAYS N$, D AND F IN LINES 120 - 140. THE REMAINING LINES BETWEEN 60-170 PROCESS AND PRINT THE DISPLAY.

LINES 180-280 ACCEPT THE NOTE OR INSTRUCTION AND PROCESS HALF AND QUARTER LENGTH NOTES BEFORE POKEING THE DATA INTO MEMORY (LINE 280).

THE REMAINDER OF THE PROGRAM OPERATES ON THE KEY LETTERS INPUT FOR PROGRAM CONTROL.

ACKNOWLEDGEMENTS GO TO RON SULLY WHOSE "SOUND EFFECTS" (ISSUE 8 OF MICRO-80) PROGRAM TAUGHT US A LOT, (LINES 10,20 AND 280) AND TO MICRO-80 FOR "S-KEY" WHICH SPEEDS UP PROGRAM WRITING CONSIDERABLY.

***** PAYROLL LII/16K (C) Lance J. Lawes *****

This program is a simple payroll designed to operate on a L11/16k cassette system. A printer is optional and modifications to convert the program for use with an ESF are shown in the LISTing inside REM statements. The program caters for up to 20 employee records at a time. It will load from and save to cassette the year-to-date pay records for each employee in the batch. These records include:-

- hours worked
- gross pay
- group tax
- 3 wage deductions
- net pay

and will handle weekly and hourly payroll.

The program handles simple payroll calculations. For complex calculations, work out your figures separately and enter them into the program manually, using the manual override functions. The tax calculation formula is based on rates applicable in Australia as at 1st July 1980. As tax rates change, new schedules may be obtained from the taxation office and the program amended and edited accordingly. The tax calculations commence at Line 740, overseas readers may like to restructure this part of the program to suit there own requirements (we would be happy to publish amendments sent in by readers - Ed.)

The employee master file (the authors term for DATA lines entered directly into the program using line numbers 200 to 310), contains the following data:-

```
LINE No.  PAY   NAME      HRLY RATE  WEEKLY RATE  TAX CODE
350 DATA  1,    A APPLE, 6.25,       20.00,       1
```

The example line above is exploded for clarity but is just a normal DATA line and would be entered into the program as:-

```
350 DATA 1,A APPLE,6.25,20.00,1
```

IMPORTANT: DO NOT CHANGE OR DELETE LINE 310, it contains information used by the program during execution.

All data lines MUST contain 5 items, so if data is not applicable to your use of the program, the unwanted section must be filled out will zeros or blanks, eg:-

```
350 DATA 1,A APPLE,6.25,0,1
```

NOTE THE ZERO (0) ABOVE THAT REPLACES THE UNWANTED FIGURE OF 20.00 IN THE PREVIOUS EXAMPLE.

Data input during program execution is simple, (normal BASIC program input as against the manual entry of data into program lines as previously described). Instructions appear on the screen in question-and-answer format. When all the data has been entered the user is asked to accept or reject the batch of data just entered.

The tax codes seen at the end of each line are selected from the following table:-

```
1 = NO REBATE        (single man's tax)
2 = $559 REBATE      (single parent tax)
3 = $800 REBATE      (married man's tax)
6 = NO EXEMPTION / NO REBATE
```

4 & 5 are used to manually override the above or automatically access 1,2,3 or 6.

MAIN MENU.
The program commences by displaying a menu on the screen as shown below:-

```
PAYROLL CASSETTE BASED SYSTEM - L2 16K

1==) UPDATE MASTER FILE.
2==) LOAD OLD FILE
3==) PROCESS PAYROLL
4==) SAVE NEW FILE
5==) EMPLOYEE INQUIRY
```

SELECT REQUIRED FUNCTION
Menu items 2 and 4 LOAD and SAVE your data file from cassete (or ESF). Don't forget to take the precaution of writing down your tape file position and the number of records saved on the tape and remember to position the tape to the start of the data when reloading. Payroll input is a question and answer procedure and the computer invites the required responses. Menu item 5 accesses an employee's year-to-date earnings and will output to either the screen or a printer.

Cassette system timings are :-

- 2 minutes to load the program from cassette.
- 1 minute to load or save the records for 10 employees to or from the cassette.

** EXAMPLE OF DATA ENTRY. **
The screen prompts during data entry and a set of sample responses,are shown below:-

```
PAY NUMBER ?  1

EMPLOYEE NAME  : A APPLE

SELECT 1==) HRLY RATE:  2==) WKLY RATE:  3==) BOTH  ? 1
HRS-ORD,TIME&HALF,DOUBLE   ?    40,3,3    (ie.  40  hours  normal,  3  hours
time-and-a-half and 3 hours at double time.)

EQUIV ORD TIME : 50.5

SELECT 1==) AUTO:  2==) MANUAL RATE INPUT :
HOURLY RATE       :  6.25
HOURLY EARNINGS   : 315.625
GROSS EARNINGS    : 315.625

TAX CALCULATIONS
1==) NO REBATE       3==) $800 REBATE        5==) AUTO CLC.
2==) $559 REBATE     4==) MANUAL OVERRIDE    6==) NO EXEM/REB
GROUP TAX DEDUCTED  : 78.35
DEDUCTION A :? 10
DEDUCTION B :? 5
DEDUCTION C :? 7.75
```

SAMPLE PAYROLL OUTPUT
The following is a sample of the output from this payroll program:-

```
P/NO              EMPLOYEE NAME                          DATE
  1               A APPLE                              27/3/81
ORD.H  1.5HR  2.0HR  EQ/ORD  RATE      HRLY      WEEKLY  GROSS
40.00   3.00   3.00   50.50   6.2500   315.63     0.00   315.63
GROSS        GRP/TAX      DED/A      DED/B      DED/C      NET PAY
  315.63       78.35       10.00       5.00       7.25      215.03
-------------------------------------------------------------------
P/NO              EMPLOYEE NAME                          DATE
  2               B BRAVO                              27/3/81
ORD.H  1.5HR  2.0HR  EQ/ORD  RATE      HRLY      WEEKLY  GROSS
40.00   2.00   3.00   49.00   5.5000   269.50     0.00   269.50
GROSS        GRP/TAX      DED/A      DED/B      DED/C      NET PAY
  269.50       52.80       10.00       0.00       5.00      201.70
-------------------------------------------------------------------
P/NO              EMPLOYEE NAME                          DATE
  3               C CHARLIE                            27/3/81
ORD.H  1.5HR  2.0HR  EQ/ORD  RATE      HRLY      WEEKLY  GROSS
40.00   0.00   0.00   40.00   4.7500   190.00     0.00   190.00
GROSS        GRP/TAX      DED/A      DED/B      DED/C      NET PAY
  190.00       22.55        0.00       0.00       0.00      167.45
-------------------------------------------------------------------
PAGE TOTAL FOR  27/3/81
ORD.H  1.5HR  2.0HR  EQ/ORD  RATE      HRLY      WEEKLY  GROSS
  120      5      6     140                              775.13
GROSS        GRP/TAX      DED/A      DED/B      DED/C      NET PAY
  775.13      153.70       20.00       5.00      12.25      584.18
```

As a final reminder, you should remember that each time you change the master file data you are changing the program itself and it will therefore be necessary, in addition to saving your program data, to also CSAVE the program itself onto another tape to preserve the changes.

```
  **********************************************
  *       PAYROLL   COPYRIGHT L J LAWES        *
  *   21 RODNEY ST LINDUM (07) 396 2998        *
  **********************************************

20 CLS:CLEAR200:ON ERROR GOTO1680
30 DEFINTI-J:DEFSTRF:DEFDBLA,B
40 DIMA(20,11)   'WILL HANDLE UP TO 20 EM
PLOYEE RECORDS
50 IS=12345:GOTO1060 'INITIALISE SYSTEM
60 IS=0
70 'MENU - TO RECOVER PROGRAM TYPE <GOTO
  100>
80 PRINT@0,"PAYROLL CASSETTE BASED SYSTE
M - L2 16K"
90 PRINT:PRINT@138,"1==> UPDATE MASTER F
ILE"
100 PRINT@202,"2==> LOAD OLD FILE"
110 PRINT@266,"3==> PROCESS PAYROLL"
120 PRINT@330,"4==> SAVE NEW FILE"
130 PRINT@394,"5==> EMPLOYEE ENQUIRY"
140 PRINT@704,"SELECT REQUIRED FUNCTION"
150 IN$=INKEY$:IF IN$=""THEN150 ELSEIN=V
AL(IN$)
160 ON IN GOTO170,330,430,1390,1500
170 CLS:PRINT"TO ADD, DELETE CHANGE EMPL
OYEE DETAILS
USE DATA STATEMENTS AND EDIT IN THE NORM
AL MANNER AS REQUIRED"
180 PRINT"USE LINES 340-590 FOR MASTER F
ILE DATA"
190 INPUT"PRESS <ENTER> TO CONTINUE ";IN
$:CLS:LIST200-590
200 'DATA LINES BEGIN HERE
210 DATA 1,AAPPLE,6.25,0,1
220 DATA 2,B BRAVO,5.50,0,2
230 DATA 3,C CHARLIE,4.75,0,3
240 DATA 4,D DELTA,6.50,0,6
250 DATA 5,E ECHO,0,250.00,1
260 DATA 6,F FOXTROT,4.50,20.00,2
270 DATA 7,G GOLF,6.25,20.00,3
280 DATA 8,H HOTEL,8.25,0,4
290 DATA 9,I INDIA,4.50,0,6
300 DATA10,J JULIET,6.25,0,1
310 DATA 99," ",0,0,0
320 'DATA LINES END HERE
330 'LOAD OLD FILE FROM CASSETTE
340 INPUT"PREPARE CASSETTE
PRESS <ENTER> WHEN READY TO LOAD ";IN$:P
RINT"DATA NOW LOADING..."
350 CMD"T"
360 REM...TO ENABLE FILE HANDLING ON THE
  ESF
MAKE THESE ALTERATIONS TO THE PROGRAM
LINE 360 @OPEN1
SUBSTITUTE @INPUT FOR INPUT#-1 IN #370 &
  #390
LINE 410 @CLOSE1
```

```
370 INPUT#-1,RC%   'NO OF EMPLOYEE RECORD
S ON TAPE
380 FOR I=1 TO RC%
390 INPUT#-1,A(I,1),A(I,2),A(I,3),A(I,4)
,A(I,5),A(I,6),A(I,7),A(I,8),A(I,9),A(I,
10),A(I,11)
400 NEXTI
410 CMD"R"
420 PRINT"DATA LOADING COMPLETE":FORT=1T
01000:NEXTT:CLS:GOTO80
430 'INPUT PAYROLL DATA
440 CLS:INPUT"PAYROLL FOR THE WEEK ENDIN
G   ";DA$
450 INPUT"IS THE PRINTER REQUIRED (Y/N)
";LP$
460 IF LP$<>"Y"AND  LP$<>"N" THEN450
470 IF LP$="Y" THENIFPEEK(14312)<128 THE
N480 ELSEPRINT"SWITCH PRINTER ON":GOTO45
0
480 CLS
490 H1=0:H2=0:H3=0:HR=0:RT=0:GA=0:GB=0:G
C=0:GD=0:TX=0:TY=0:TZ=0:DA=0:DB=0:DC=0:N
P=0
500 INPUT"PAY NUMBER ";PN%
510 RESTORE:I=1
520 READ MF%(I),MF$(I),MR(I),MS(I),MT(I)
530 IF MF%(I)=PN% PRINT"EMPLOYEE NAME  :
";MF$(I):RESTORE:GOTO560
540 IFMF%(I)=99 PRINT"INVALID PAY NUMBER
":RESTORE:GOTO500
550 I=I+1:GOTO520
560 PRINT"SELECT 1==> HRLY RATE:  2==> WK
LY RATE:  3==> BOTH"
570 IN$=INKEY$:IF IN$=""THEN570 ELSEIN=V
AL(IN$)
580 ON IN GOTO590,670,590
590 INPUT"HRS-ORD,TIME&HALF,DOUBLE ";H1,
H2,H3
600 HR=H1+(1.5*H2)+(2*H3):PRINT"EQUIV OR
D TIME   :";HR
610 PRINT"SELECT 1==>AUTO:  2==> MANUAL R
ATE INPUT :"
620 JN$=INKEY$:IF JN$="" THEN620 ELSEJN=
VAL(JN$)
630 ON JN GOTO640,650
640 RT=MR(I):PRINT"HOURLY RATE   :";RT:GO
TO660
650 INPUT"HOURLY RATE   :";RT
660 IF IN=3 THEN670 ELSE720
670 PRINT"SELECT 1==> AUTO:  2==> MANUAL
EARNINGS INPUT"
680 JN$=INKEY$:IF JN$=""THEN680 ELSEJN=V
AL(JN$)
690 ON JN GOTO700,710
700 GB=MS(I):PRINT"WEEKLY EARNINGS   :";G
B:GOTO720
710 INPUT"WEEKLY EARNINGS   :";GB
720 GA=HR*RT:GC=GA+GB:GD=INT(GC)+1:PRINT
"HOURLY EARNINGS   :";GA
730 PRINT"GROSS EARNINGS   :";GC
740 'TAX CALCULATIONS
750 PRINT"TAX CALCULATIONS"
760 PRINT"1==> NO REBATE     3==> $800 RE
BATE     5==> AUTO CALC."
770 PRINT"2==> $559 REBATE   4==> MANUAL
OVERIDE 6==> NO EXEM/REB"
780 IM$=INKEY$:IF IM$=""THEN780 ELSEIM=V
AL(IM$)
790 ON IM GOTO800,800,800,910,860,880
800 IF GD<75 THENTX=0:GOTO920
810 IF GD<326 THENTX=GD*.325-24.35:GOTO8
30
820 IF GD<657 THENTX=GD*.46-68.42 ELSETX
=GD*.6-160.53
```

```
830 IF IM=1THEN920
840 IF IM=2THENTX=TX-10.621:GOTO920
850 IF IM=3THENTX=TX-15.2:GOTO920
860 IM=MT(I):IF IM=1 OR IM=2 OR IM=3 T
HEN790
870 IF IM=4THEN910 ELSEIFIM=6 THEN880
880 IF GD<202 THENTX=GD*.32-.32:GOTO920
890 IF GD<533 THENTX=GD*.46-28.6 ELSETX=
GD*.6-103.29
900 GOTO920
910 INPUT"MANUAL TAX CALCULATION  :";TX
920 'ROUNDING OFF TO NEAREST 5 CENTS
930 TX=TX*10:TY=INT(TX):TZ=TX-TY
940 IF TZ<.25THENTZ=0:GOTO960
950 IF TZ<.75THENTZ=.5 ELSETZ=1
960 TX=(TY+TZ)/10
970 PRINT"GROUP TAX DEDUCTED  :";TX
980 INPUT"DEDUCTION A  :";DA
990 INPUT"DEDUCTION B  :";DB
1000 INPUT"DEDUCTION C  :";DC
1010 NP=GC-TX-DA-DB-DC
1020 PRINT"NETT TAKE HOME PAY  :";NP
1030 PRINT"SELECT 1==> ACCEPT: 2==> REJE
CT"
1040 IP$=INKEY$:IF IP$=""THEN1040 ELSEIP
=VAL(IP$)
1050 ON IP GOTO1060,1150
1060 F1="###                    %
    %                  %        %"
1070 F2="##.##   ##.##   ##.##   ##.##   ##.
####   ####.##  ####.##  ####.##"
1080 F3="#####.##   ######.##    ####.##
 ####.##    ####.##    #####.##"
1090 F4="#####   #####   #####   #####
                  #####.##"
1100 H1$="P/NO                EMPLOYEE NAME
                  DATE"
1110 H2$="ORD.H   1.5HR   2.0HR   EQ/ORD   R
ATE      HRLY      WEEKLY   GROSS"
1120 H3$="GROSS          GRP/TAX      DED/A
    DED/B      DED/C      NET PAY"
1130 IF IS=12345 THEN60 ELSE1140
1140 GOTO1160
1150 CLS:GOTO480
1160 'UPDATE FILE TOTALS
1170 I=PN%:A(I,2)=A(I,2)+H1:A(I,3)=A(I,3
)+H2:A(I,4)=A(I,4)+H3:
A(I,5)=A(I,5)+HR:A(I,6)=A(I,6)+GC:A(I,7)
=A(I,7)+TX:A(I,8)=A(I,8)+DA:A(I,9)=A(I,9
)+DB:A(I,10)=A(I,10)+DC:A(I,11)=A(I,11)+
NP:DV=0
1180 'SCREEN/PRINTER OUTPUT
1190 CLS:PRINT
1200 PRINTH1$:IF LP$="Y"LPRINTH1$
1210 PRINTUSINGF1;PN%,MF$(I),DA$:IF LP$=
"Y"LPRINTUSINGF1;PN%,MF$(I),DA$
1220 PRINT:PRINTH2$:IF LP$="Y"LPRINTH2$
1230 PRINTUSINGF2;H1,H2,H3,HR,RT,GA,GB,G
C:IF LP$="Y"LPRINTUSINGF2;H1,H2,H3,HR,RT
,GA,GB,GC
1240 PRINT:PRINTH3$:IFLP$="Y"LPRINTH3$
1250 PRINTUSINGF3;GC,TX,DA,DB,DC,NP:IF L
P$="Y"LPRINTUSINGF3;GC,TX,DA,DB,DC,NP:LP
RINT" "
1260 A(0,2)=A(0,2)+H1:A(0,3)=A(0,3)+H2:A
(0,4)=A(0,4)+H3:A(0,5)=A(0,5)+HR:A(0,6)=
A(0,6)+GC:A(0,7)=A(0,7)+TX:A(0,8)=A(0,8)
+DA:A(0,9)=A(0,9)+DB:A(0,10)=A(0,10)+DC:
A(0,11)=A(0,11)+NP 'ACCUMULATE
PAGE TOTALS
1270 IF LP$="Y"THENLPRINTSTRING$(63,95):
LPRINT" "
1280 PRINT"SELECT 1==> NEXT: 2==>END:"
1290 IN$=INKEY$:IF IN$=""THEN1290 ELSEIN
=VAL(IN$)
```

```
1300 ON IN GOTO1310,1320
1310 CLS:GOTO480
1320 CLS:PRINT:PRINT
1330 PRINT"PAGE TOTAL FOR  ";DA$:IF LP$=
"Y"LPRINT"PAGE TOTAL FOR  ";DA$
1340 PRINTH2$:IF LP$="Y"LPRINTH2$
1350 PRINTUSINGF4;A(0,2),A(0,3),A(0,4),A
(0,5),A(0,6):
IF LP$="Y"LPRINTUSINGF4;A(0,2),A(0,3),A(
0,4),A(0,5),A(0,6)
1360 PRINTH3$:IF LP$="Y"LPRINTH3$
1370 PRINTUSINGF3;A(0,6),A(0,7),A(0,8),A
(0,9),A(0,10),A(0,11):
IF LP$="Y"LPRINTUSINGF3;A(0,6),A(0,7),A(
0,8),A(0,9),A(0,10),A(0,11)
1380 PRINT"END OF RUN":PRINT:INPUT"PRESS
 <ENTER> TO CONTINUE ";IC:CLS:GOTO80
1390 'SAVE NEW FILE
1400 INPUT"PREPARE CASSETTE
TYPE NUMBER OF EMPLOYEE RECORDS ON FILE
THEN PRESS <ENTER> WHEN READY :";RC%:PRI
NT"DATA NOW BEING WRITTEN TO TAPE....."
1410 CMD"T"
1420 REM...TO ENABLE FILE HANDLING ON TH
E ESF
MAKE THESE ALTERATIONS TO THE PROGRAM
LINE 1420 @OPEN1
SUBSTITUTE @PRINT FOR PRINT#-1 IN #1430
& #1450
LINE 1480 @CLOSE1
1430 PRINT#-1,RC%
1440 FOR I=1TO RC%
1450 PRINT#-1,A(I,1),A(I,2),A(I,3),A(I,4
),A(I,5),A(I,6),A(I,7),A(I,8),A(I,9),A(I
,10),A(I,11)
1460 NEXTI
1470 PRINT".....DATA SAVE COMPLETE"
1480 CMD"R"
1490 FORT=1TO1000:NEXTT:CLS:GOTO80
1500 'EMPLOYEE ENQUIRY (YEAR TO DATE TOT
ALS)
1510 CLS:PRINT:PRINT
1520 INPUT"IS THE PRINTER REQUIRED (Y/N)
";LP$
1530 IF LP$="Y" THENIFPEEK(14312)<128 TH
EN1540 ELSEPRINT"PRINTER NOT READY":GOTO
1520
1540 INPUT"ENTER REQUIRED PAY NUMBER :";
PN%
1550 RESTORE:I=1
1560 READ MF%(I),MF$(I),MR(I),MS(I),MT(I
)
1570 IF MF%(I)=PN% THEN1580 ELSEIFMF%(I)
=99 THEN1540 ELSEI=I+1:GOTO1560
1580 DA$="Y. T. D."
1590 PRINT:PRINTH1$:IF LP$="Y" LPRINT H1
$
1600 PRINTUSINGF1;PN%,MF$(I),DA$:PRINT:I
F LP$="Y"LPRINTUSINGF1;PN%,MF$(I),DA$
1610 PRINTH2$:IF LP$="Y"LPRINTH2$
1620 PRINTUSINGF4;A(I,2),A(I,3),A(I,4),A
(I,5),A(I,6):IF LP$="Y"
LPRINTUSINGF4;A(I,2),A(I,3),A(,4),A(I,5)
,A(I,6)
1630 PRINT:PRINTH3$:IF LP$="Y"LPRINTH3$
1640 PRINTUSINGF3;A(I,6),A(I,7),A(I,8),A
(I,9),A(I,10),A(I,11):IF LP$="Y"LPRINTUS
INGF3;A(I,6),A(I,7),A(I,8),A(I,9),A(I,10
),A(I,11)
1650 PRINT:PN%=PN%+1:INPUT"ENTER NEXT PA
Y NUMBER (999 TO EXIT) ";PN%:CLS
1660 IF PN%=999 THENCLS:GOTO80
1670 GOTO1550
1680 RESUMENEXT
```

********** NEXT MONTH'S ISSUE **********

Next month's issue will contain at least the following programs plus the usual features and articles.

** ARITHMETIC LEVEL I **
An arithmetical tester for 9 to 10 year olds. Tests addition, subtraction and multiplication.

** PHILATELIC ADVISER LII/16K **
It's all about stamps just in case you did'nt know what Philatelic means. This program gives all sorts of advice on stamps and their value. You can't deny that we cater for everbody, can you.

** DISASSEMBLER IN BASIC - LII/16K **
Now you can disassemble all that mysterious looking HEX code in ROM or anywhere else for that matter. This program lists on the screen, the assembly language source code corresponding to a machine language program anywhere in memory.

** CLOCK LEVEL II m/l **
An ideal program to load into your '80 when you are not using it. It displays the time in large graphic numbers giving the hours, minutes, seconds and tenths of a second. Makes it the most expensive clock you ever had.

** BONES LII/4K **
A two-player game that tests your reaction time to see who can finish building a skeleton first. The player who presses a key, first gets a bone. It makes you wonder what the author does for a living!

** SORTING DEMONSTRATION LEVELI **
If you have ever wondered what has been going on inside your '80 while it is putting numbers in the correct numerical order, this program will show you.

** LOWER-CASE DRIVER LII m/l **
The long awaited lower-case driver routine to enable you to display both upper and lower-case in BASIC (with a suitably modified computer). Written in machine language by Eddy Paay, this one program is suitable for all computers from Level II 4K to 48K Disk systems. How has he done it? See if you can work it out before the next issue.

APPLICATION FOR PUBLICATION OF A PROGRAM IN MICRO-80

Date .....

Tick where appropriate

To **MICRO-80**
Please consider the enclosed program for . . .

(i) Publication in MICRO-80 .....

(ii) Publication on disk or cassette only .....

(iii) Both .....

Name .....

Address .....

.....

.....Postcode .....

***** CHECK LIST *****

Please ensure that the cassette or disk is clearly marked with your name and address, program name(s), Memory size, Level I, II, System 1 or 2, Edtasm, System, etc. The use of REM statements with your name and address is suggested, in case the program becomes separated from the accompanying literature.

Ensure that you supply adequate instructions, notes on what the program does and how it does it, etc.

For system tapes, the start, end, and entry points, etc.

The changes or improvements that you think may improve it.

Please package securely — padabags are suggested — and enclose stamps or postage if you want your cassette or disk returned.

***** CASSETTE EDITION INDEX *****

The cassette edition of MICRO-80 contains all the software listed each month, on cassette. All cassette subscribers need do is CLOAD and RUN the programs. Level II programs are recorded on side 1 of the cassette and Level I programs on side 2. All programs are recorded twice in succession. The rates for a cassette subscription are printed on the inside front cover of each issue of the magazine.

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80 COMPOSER	L2/16K	C	132	89	89
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MICRO-80

LEVEL II ROM REFERENCE MANUAL

by Edwin Paay

Published by MICRO-80 PRODUCTS

Written by Eddy Paay, the LEVEL II ROM REFERENCE MANUAL is the most complete explanation of the Level II BASIC interpreter ever published.

Part 1 lists all the useful and usable ROM routines, describes their functions explains how to use them in your own machine language programs and notes the effect of each on the various Z 80 registers.

Part 1 also details the contents of system RAM and shows you how to intercept BASIC routines as they pass through system RAM. With this knowledge, you can add your own commands to BASIC, for instance, or position BASIC programs in high memory—the only restriction is your own imagination!

Part 2 gives detailed explanations of the processes used for arithmetical calculations, logical operations, data movements, etc. It also describes the various formats used for BASIC, SYSTEM and EDITOR/ASSEMBLER tapes. Each section is illustrated by sample programs which show you how you can use the ROM routines to speed up your machine language programs and reduce the amount of code you need to write.

The LEVEL II ROM REFERENCE MANUAL is intended to be used by machine language programmers. It assumes a basic understanding of the Z 80 instruction set and some experience of Assembly Language programming. But BASIC programmers too will benefit from reading it. They will gain a much better insight into the functioning of the interpreter which should help them to write faster, more concise BASIC programs.

MICRO-80